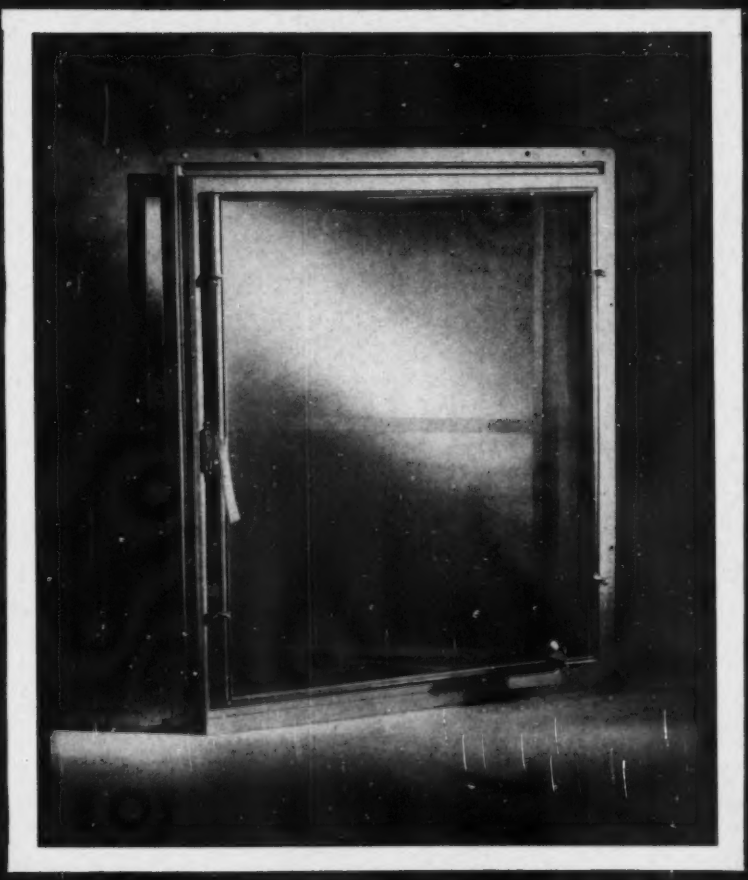
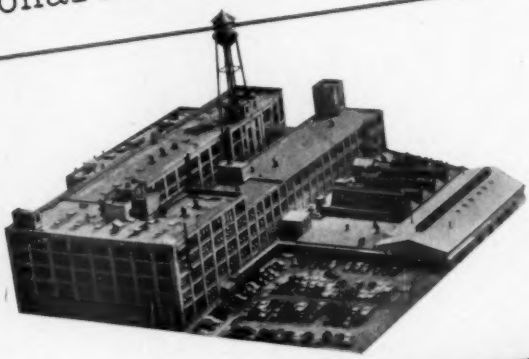
DIE CASTINGS

INCLUDING A SPECIAL FINISHING SECTION



THE PRODUCT DESIGN MAGAZINE FOR USERS AND POTENTIAL USERS OF DIE CASTINGS

Rx Take your Casting, Finishing and Assembly problems to Monarch Aluminum Mfg. Company



This Prescription IS Habit-Forming!

Nationally-known manufacturers rely upon Monarch's outstanding facilities for casting, finishing and product assembly. Monarch operations are geared to the requirements of industry at all times.

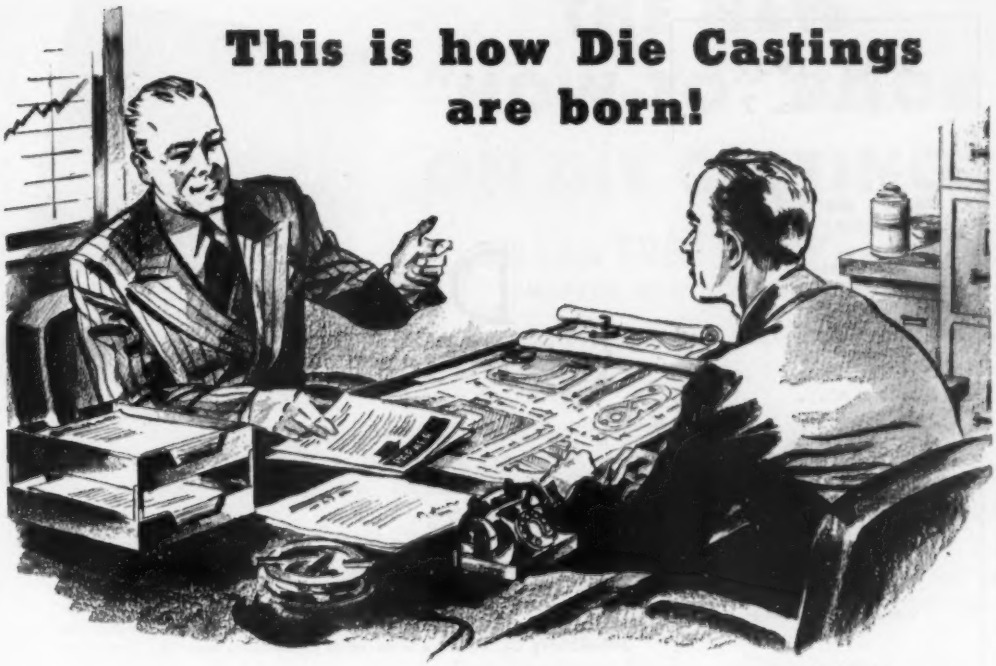
Today, defense requirements for aluminum permanent mold, aluminum and zinc die castings require concentrated attention. Monarch is actively producing these needs. We will also apply the same facilities to help you meet important civilian production schedules.

Get the Monarch habit today! We believe it can help you.

• WRITE TODAY for Monarch's FACT FILE for design, purchasing and production executives. It's a "must" for your important source files.

MONARCH ALUMINUM MFG. COMPANY • Detroit Avenue at West 93rd Street, Cleveland 2, Ohio

This is how Die Castings are born!



THIS Parker sales engineer is prepared to take a load off your shoulders. He will show you how that difficult part can be produced better through Die Casting. Parker Die Castings are in use in nearly every industry, having been produced quickly and economically. As the Parker sales engineer talks to you, it will become apparent that Die Castings will do the job better. Through the close contact between you and a Parker Sales Engineer . . . that is how Die Castings are born. And Parker Die Castings will prove profitable to you.

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And when you think of Die Castings

- - THINK OF

Parker White-Metal Company • 2153 McKinley Ave. Erie, Penna.

PARKER ALUMINUM *and* ZINC *Die Castings*

JULY 1951
Vol. 9 No. 7

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COVER—ONE-PIECE WINDOW FRAMES die cast in aluminum cut down on draft seepage and cold areas around windows which are due to variations in the conventional types of welded metal frames. Eight important, specific advantages for this type of window construction, now being manufactured by Lea-Bachman Manufacturing Co., are listed in an article beginning on page 20.

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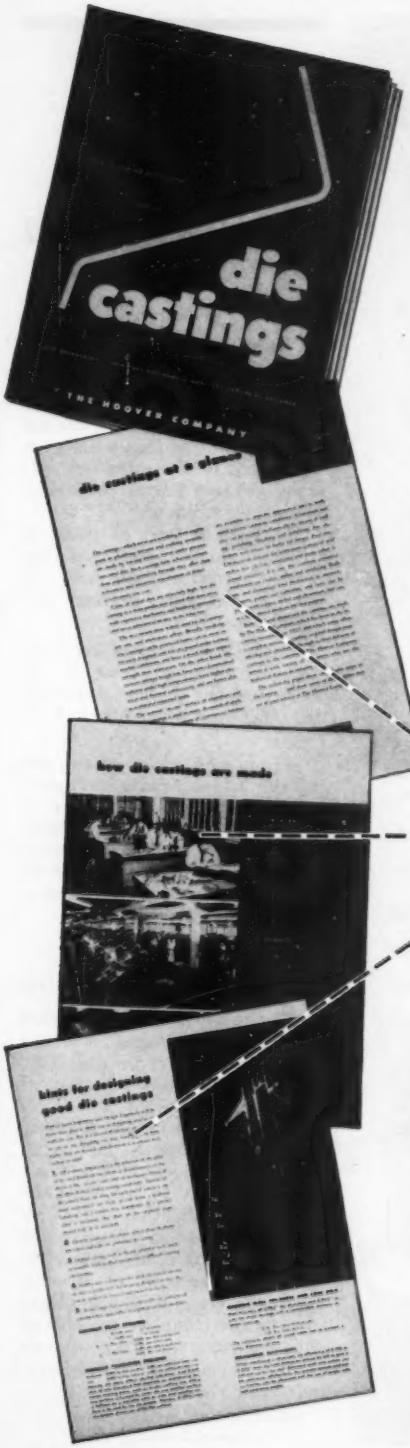
die castings
THE HOOVER COMPANY
die castings at a glance
how die castings are made
hints for designing good die castings

THE NEW "HOW-TO" BOOK ON DIE CASTINGS

GET YOUR FREE COPY OF THIS HELPFUL NEW BOOKLET NOW!

Manufacturers everywhere can profit from this authoritative new handbook on "How to step up production and cut costs with die castings."

It's big enough to cover a big subject, small enough to fit in a filing cabinet. It features basic information for management men on the cost-cutting advantages of die castings . . . contains practical suggestions and factual data for designers and product engineers.

It's offered as a free service by The Hoover Company, and it's based on Hoover's 29 years' experience in designing and making successful castings.

Tear off the coupon below and mail it today for your free copy!

TAKE A LOOK AT THESE SAMPLE PAGES:

DIE CASTINGS AT A GLANCE. A quick run-down on what die castings are, why they're so popular, and what kinds of castings to use for various purposes.

HOW DIE CASTINGS ARE MADE. Here's one of several picture pages showing the progress of a die casting job from start to finish, from idea to customer.

HINTS FOR DESIGNING. Suggestions, reminders, listings of specifications and tolerances . . . all sorts of information to help plan die castings that will look well, work well, and cut production costs.

Besides sending for your free copy of this helpful new book, you may need help on some special problem. Call in a Hoover sales engineer. There's no obligation.

HOOVER

Specialists in the field of die castings

THE HOOVER COMPANY, Die Casting Division, North Canton, Ohio.
Please send me a free copy of your new DIE CASTING BOOKLET.

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LOWER COSTS
REDUCED MACHINING
BETTER FINISH
GREATER ACCURACY
GREATER PRODUCTION

● Sign posts along the road to manufacturing efficiency point to the Newton-New Haven Co. as the single source for your die casting needs.

You can be sure you are headed in the right direction when you bring your die casting problems to Newton-New Haven. Here is an organization that has the equipment, the personnel, the experience and the whole-hearted desire to help.

Newton-New Haven has prepared a booklet on "Dimensioning Die Castings." This is a basic data that every Engineer and Designer should have. Write on your company letterhead for your copy.

NEWTON NEW HAVEN
THE NEWTON-NEW HAVEN COMPANY
689 THIRD AVENUE WEST HAVEN 16 CONNECTICUT

LETTERS *to the Editor*

DIE CAST HAT FORMS

We would like to know if there is an Association of die casting firms, and if so, the address of same so that we can obtain a list of the members who make die cast forms for ladies' and men's millinery.

We have a type of material which might be used by the "hat block" manufacturers who are having difficulty getting raw materials.—E.G.

The organization of commercial die casting firms is the American Die Casting Institute, 366 Madison Ave., New York City.

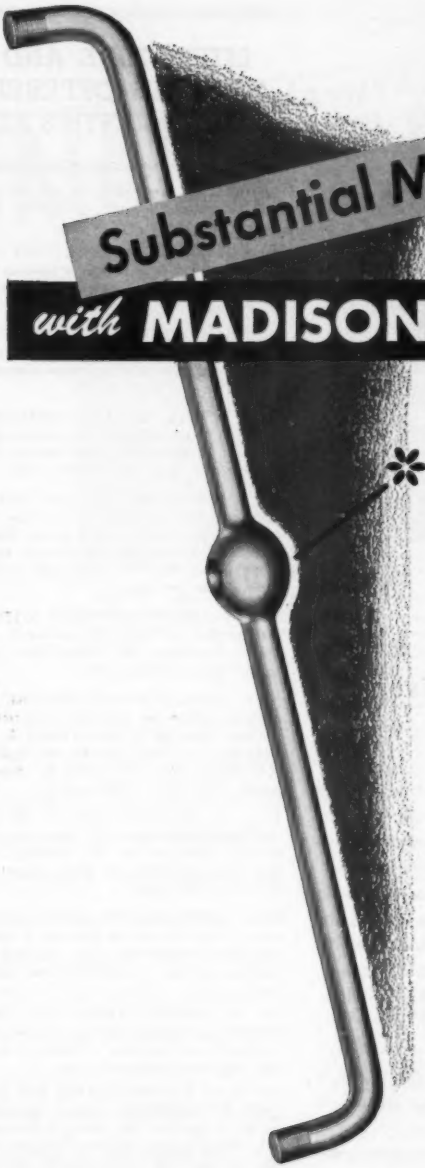
We do not know of any die casting firms producing such millinery forms, but if any of our readers wish further information about the raw materials available to them, we will be pleased to forward the inquiry. —Ed.

LACQUER TO SIMULATE PLATING

We are very much interested in the bronze lacquer which simulates plating, as described in the New Products Section of your April issue of Die Castings. From the article it seems that this lacquer is just what we have been looking for. However, we wrote to the National Lacquer & Paint Company, Chicago—the address given in the article—but our letter was returned on account of insufficient address. Will you please give us the complete address of this company so that we can contact them regarding our requirements?—W. K. K.

Information sent.—Ed.

(Continued on Page 29)



Substantial Material Savings

with MADISON-KIPP Die Castings

Only the center portion of the bracket here illustrated is die cast. This scheme represents a great saving in metal and labor as do many die castings.

Your problem may not be exactly like this particular case but it may be similar enough to give you a new idea of procedure with Madison-Kipp zinc or aluminum die castings.

Please send all inquiries to our home office in Madison.

MADISON-KIPP CORPORATION

213 WAUBESA STREET, MADISON 10, WIS., U.S.A.

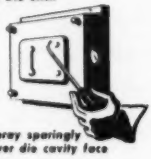
ANCIENS ATELIERS GASQUY, 31 Rue du Marais, Brussels, Belgium, sole agents for Belgium, Holland, France, and Switzerland.

WM. COULTHARD & CO. Ltd., Carlisle, England, sole agents for England, most European countries, India, Australia, and New Zealand.

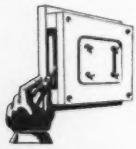
- *Skilled in* DIE CASTING *Mechanics*
- *Experienced in* LUBRICATION *Engineering*
- *Originators of Really High Speed* AIR TOOLS

aspirin alone won't cure Castor's headache this time

1. Dip blow pipe in Die Slick



2. Spray sparingly over die cavity face



3. Spray on ejector mechanism

And when a run of dirty, unplatable castings makes your plating department want to do this sort of thing, it's time to forget drugstore remedies and lick the whole headache with Die Slick.

Die Slick puts an end to stains, ground-in dirt, and poor surface finish—stops most plating problems before they arise. It knocks out the costly headaches of sticking, soldering, scoring, and other faults due to improper die lubrication. Unlike part-time lubricants, each of the five grades of Die Slick is uniform—standardized to do its job all the time—and is used by nearly four out of every five die casters because of proved performance.

Try Die Slick on a no-risk basis. Specify the quantity you desire and the type of alloy on which you will use it. If you're not fully satisfied, simply return the unpaid invoice.

start every job with **DIE SLICK**

the industry's standard die lubricant

G. W. SMITH & SONS, INC., 5403 Kemp Road, Dayton 3, Ohio

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LITERATURE AND SERVICES OFFERED IN THIS MONTH'S ADS

NOTE: Circle numbers on the enclosed postcard to indicate literature, samples or trial services you wish to receive.

No. 1. "WE'RE GEARED FOR YOUR DEFENSE NEEDS" is a booklet explaining the Advance Tool & Die Casting Co.'s facilities for producing die castings.

No. 2. LITERATURE AND DESIGN INFORMATION on aluminum and magnesium die castings are available from Litemetal Dicast, Inc.

No. 3. DETAILS OF THE HYDROHONE PROCESS, a wet abrasive blast cleaning and polishing system usable on die casting dies, are available from the Pangborn Corp.

No. 4. BURNISHING BALLS AND SHAPES and suggestions on how to use them are contained in a catalog issued by the Abbott Ball Co. The company manufactures burnishing shapes made of bearing ball steel in many shapes and sizes.

No. 5. FILTERS FOR HYDRAULIC SYSTEMS are described in Folder 105, offered by the Marvel Engineering Co. These filters have no moving or wearing parts.

No. 6. FURNACES FOR MELTING ZINC and aluminum alloys are described in literature available from the Stroman Furnace & Engineering Co. These furnaces are built in both dip-out and tilt models in capacity ranges from 200 to 14,000 pounds.

No. 7. A "HOW-TO" BOOKLET ON DIE CASTINGS is offered by the Hoover Co. The booklet shows uses for die castings, tells how they are made and gives suggestions on die casting design.

No. 8. GRINDER MILLERS made by the Precise Products Co. can be attached to lathes and other machine tools. They are used for grinding, milling, microfinishing and polishing.

No. 9. BUFFING WHEELS AND COMPOUNDS and other finishing supplies are illustrated and described in literature available from the Formax Mfg. Corp.

No. 10. AN ELECTRO-CLEANER AND SURFACE CONDITIONER designed especially for use on zinc-base die castings is described in a Diversey Corp. bulletin. Diversey No. 505 is used for reverse-current electrocleaning and surface conditioning.

No. 11. INFORMATION ON INDUCTION FURNACES for foundry operations is offered in Ajax Engineering Corp. literature.

No. 12. PNEUMATIC DEVICES, including drill press feeds, work-holding fixtures and air cylinders are shown in a catalog offered by the Mead Specialties Co.

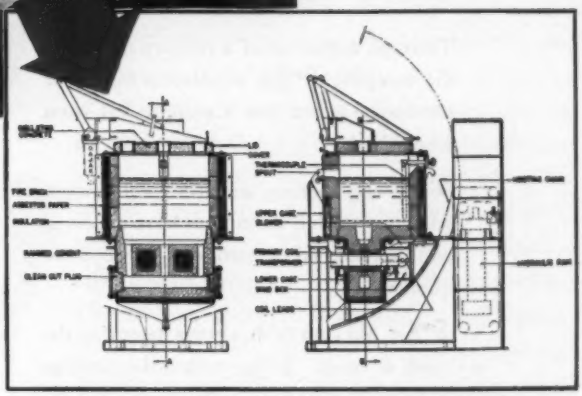
No. 13. "HOW TO STRIP PAINT" is the title of a booklet offered by Oakite Products, Inc. The booklet gives instructions for using paint stripper and makes recommendations for stripping various types of finishes.

TAMA-WYATT AJAX INDUCTION FURNACES

Cut Foundry Melting Cost

Accurate records at the National Pressure Cooker Co., Eau Claire, Wisc., show that over a two-year period the AJAX Induction Furnace was capable of reducing melting costs by as much as 40%.

Partial view of National Pressure Cooker Co.'s melting room showing AJAX Induction Furnaces.



Cross-section drawings of 166 Kw. twin-coil AJAX Induction Furnace with hydraulic tilting device, same as shown in photograph above.

Due to the nature of their use, pressure cooker castings must maintain exceptionally high standards of casting quality. Not only does the induction furnace effect a saving in melting cost but, in addition, working conditions are greatly improved.

Note from the diagram above that the operation of the AJAX Furnace is based on the induction principle, whereby energy is transmitted to the molten charge without actual contact, through the refractory walls. Only the metal is heated, and therefore there are no resistors or other parts having a higher temperature than is absolutely necessary for properly melting the charge. A gentle movement of the bath insures uniform temperature and homogeneous mixing of the ingredients. Linings are made of inert refractories which do not contaminate the melt. Temperature control is entirely automatic.

Write For Further Facts and Information

AJAX ENGINEERING CORP., TRENTON 7, N. J.

AJAX TAMA-WYATT **INDUCTION MELTING FURNACE**

AJAX ELECTRO METALLURGICAL CORP., and Associated Companies
AJAX ELECTROTHERMIC CORP., Ajax Northrup High Frequency Induction Furnaces
AJAX ELECTRIC CO., INC., the Ajax Hultgren Electric Salt Bath Furnace
AJAX ELECTRIC FURNACE CORP., Ajax Wyatt Induction Furnaces for Melting

DEPENDABLE
BETTER METHODS
SUPER CAST
DIE CASTINGS
BETTER DIE CASTINGS
SINCE 1919

The meaning of a signature!

Through a quarter of a century of knowing how, the SUPER CAST reputation for Better Methods—Better Die Castings, has been recognized.

Sound engineering, metallurgical knowledge and skilled techniques have achieved and maintained a standard of superior quality.

SUPER CAST has kept faith, always deserving the mark it bears. SUPER CAST means die castings for those who want the best.

A sound, time-tested institution and a sound time-tested product have won confidence and widespread endorsement.

THE SUPERIOR DIE CASTING COMPANY

1001 London Road CLEVELAND 10, OHIO

Detroit Chicago Pittsburgh
Philadelphia New York

LITERATURE AND SERVICES

(Continued from Page 6)

No. 14. ENAMEL FILLING OF RECESSES in die cast parts is illustrated and described in literature available from the Acromark Co.

No. 15. DIE CASTING, machining, painting and plating facilities of the Admiral Die Casting Corp. are shown in a bulletin offered by the company.

No. 16. EXAMPLES OF DIE CASTINGS in zinc and aluminum made by the Tri-State Die Casting Corp. are presented in a catalog offered by the company.

No. 17. ASSURANCE OF SOUND DIE CASTINGS by control of alloy content is the purpose of the Certified Zinc Alloy Plan. A bulletin available from the American Die Casting Institute explains how the plan works and its value to the buyer of die castings.

No. 18. "ADVANCED BARREL FINISHING" is the title of a booklet offered by the Almco Division, Queen Stove Works. The booklet gives details of the Supersheen method of controlled barrel deburring, grinding and polishing.

No. 19. SPEEDING MACHINING OPERATIONS by the use of Bellows Co. air devices is the subject of the company's Foto Facts File. Several examples are given of machining operations on die castings.

No. 20. PHYSICAL PROPERTIES and compositions of USCO aluminum alloys are given on a slide-chart offered by the U. S. Reduction Co. By positioning the pointer under the alloy number, the user can read the information in windows on the chart.

No. 21. "HOW TO DIMENSION PRINTS FOR DIE CASTINGS" is the title of a booklet offered by the Newton-New Haven Co. The booklet gives detailed instructions for guidance in dimensioning die casting drawings.

No. 22. A FOLDER DESCRIBING THE MONARCH Aluminum Mfg. Co.'s plant and its zinc and aluminum die casting facilities is available from the company.

No. 23. SAMPLES OF TINY DIE CASTINGS and bulletins covering production facilities are offered by the Gries Reproducer Corp. This company specializes in very small zinc die castings.

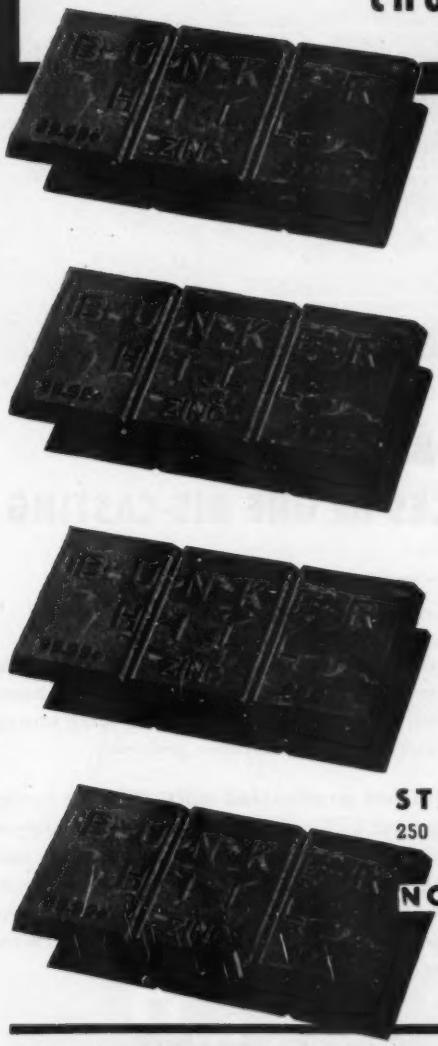
No. 24. EBONOL-Z, A BLACK COATING PROCESS designed especially for zinc die castings will be applied to sample parts by Enthone, Inc. A check list is also offered by the company.

No. 25. SELF-TAPPING SCREWS, what they are, how they're used, sizes and types available and other pertinent data are contained in a handbook offered by Parker-Kalon Corp.

No. 26. SIMULATED PLATED FINISHES are given to die castings with Platelustre, a paint recently marketed by the Maas & Waldstein Co. Literature is available on this product, which may be used to simulate copper, brass or bronze plating.

(Continued on Page 29)

Eliminating the HUMAN ELEMENT



THE die casting industry's specifications for base metals of unvarying high purity, have made mandatory greater precision and efficiency in the production of these metals. In the Bunker Hill electrolytic process, by means of which the first "four-nines" zinc was produced commercially, the human element with its liability to error in the vital concurrent analytical work, is largely eliminated. Bunker Hill extensively employs mechanically controlled devices as a means of making physical and chemical determinations. Microphotometers for spectrographic analysis and electrometric titrating apparatus make possible a refinement of control not humanly attainable. As a result, the purity-constant of Bunker Hill 99.99+% Zinc enables die casters to maintain the high quality necessary for the best physical properties.

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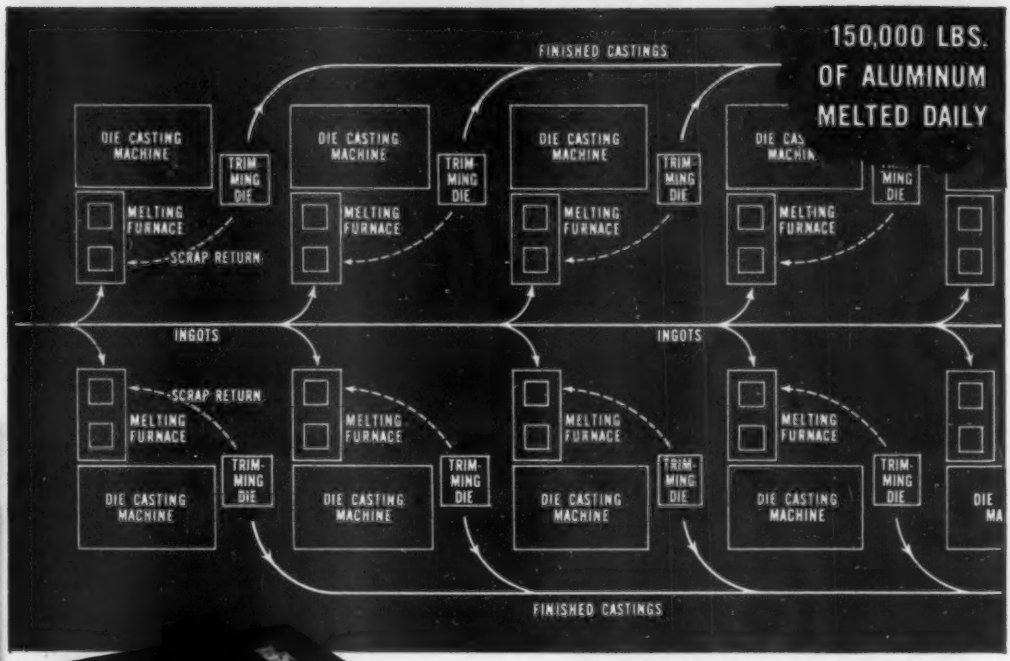

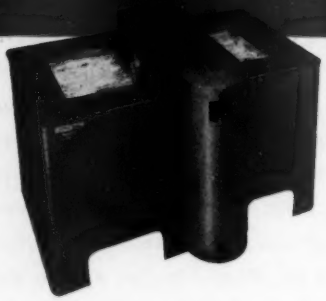

15 LINDBERG 2-CHAMBER FURNACES IN ONE DIE-CASTING PLANT....

One of the nation's newest die-casting plants uses 15 Lindberg Two-Chamber Furnaces in their die casting operations. These furnaces, operating on a 24 hour a day schedule have the capacity to melt 150,000 lbs. of alloy per day. Each furnace serves a separate die casting machine to produce these production advantages . . .

No melting room needed—all metal is melted at the casting machine, eliminating the need for carrying hot metal through the plant.

No scrap sorting—scrap metal and reject castings never leave the machine, allowing the use of a different alloy in each machine if necessary, while completely eliminating scrap sorting, handling and identification problems.

Unified production unit—each die casting machine becomes a unified production unit—receiving cold alloy ingot, melting, holding, casting, inspecting, reclaiming scrap metal and reject castings—delivering only the finished casting to the production line. Obviously the savings realized are spectacular.

LINDBERG-Fisher MELTING FURNACES

Lindberg Engineering Co., 2470 W. Hubbard Street, Chicago 12, Illinois

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ON BOTH FRONTS
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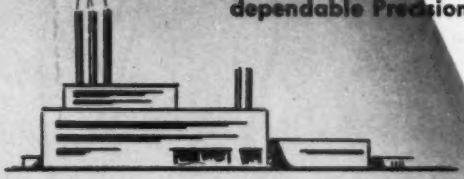
Meets the Demand for Die Castings in Defense AND Civil Production Needs with 7 Completely Equipped Plants

As increasing numbers of manufacturers discover that die cast products and components are lighter, stronger, and cost less, Precision faces an ever-increasing challenge. A long-established leader in the die casting industry, Precision is meeting that challenge by employing the greatest technological experience and ability available anywhere in the field . . . supplying both civil and defense production needs with accurate, dependable Precision die castings.



Call a PRECISION Engineer, Today!

"Since 1909 the name "PRECISION" has been the symbol of highest quality in the die casting industry"

PRECISION CASTINGS CO., Inc.

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British Affiliation — Wolverhampton Die Casting Co., Wolverhampton, England

for Quality Production

AMERICAN ELECTROLYTIC

99.99+%

SLAB ZINC

A reliable source for die casting requirements

AMERICAN ZINC SALES COMPANY
Distributors for
American Zinc Lead & Smelting Company
Columbus, Ohio • Chicago • St. Louis • New York

DIE CASTING
washes out the production "blues"

Montgomery Ward's modern washing machine with gyroscopic drive—a gearless mechanism designed for trouble-free service. (Built for Montgomery Ward by Apex Electrical Mfg. Co., Cleveland, Ohio)

CASE HISTORIES FROM MT. VERNON FILES

Die Casting eliminates those gloomy high cost factors that often threaten to "soak" you plenty once your projects begin to take shape on the drawing board.

For instance, it was the ***reduced cost of production,*** without sacrifice of quality, that determined the makers of Montgomery Ward's "Supreme" Automatic Washing Machine to specify die casting.

The aluminum basket hub (A) was originally sand cast. Die casting has reduced the initial cost of the casting, and cut machining costs.

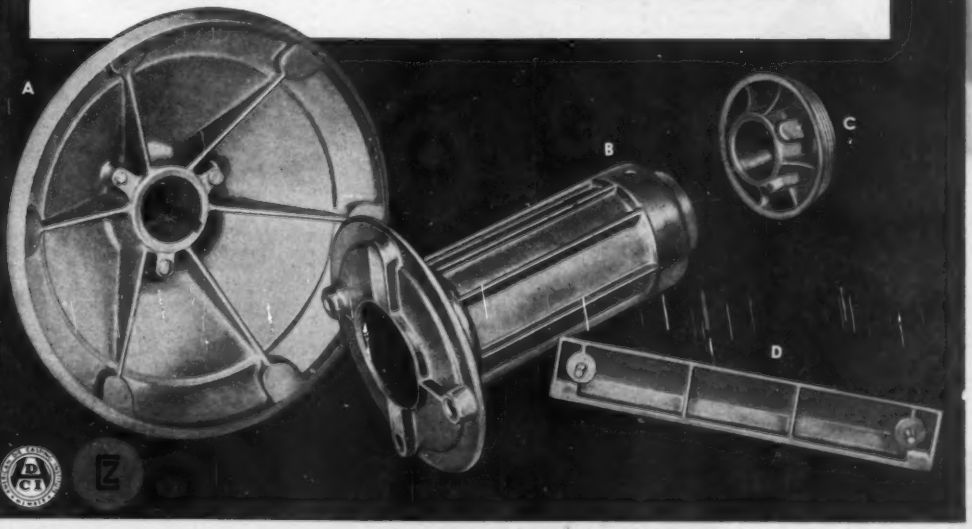
The main bearing carrier (B) was originally a steel tube and flange, arc welded. Redesigned for die casting, this part is produced at a saving of approximately $2.50.

The cam collar (C) was originally turned from steel bar stock. Die cast, the item costs approximately 60¢ less to produce.

The portion of the lid hinge (D) was originally cast brass. As an aluminum die casting, about 25¢ have been pared from its production cost.

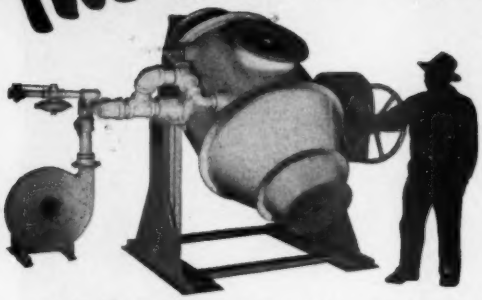
While it may be noted that prior to the adoption of die casting this washing machine was not in high volume production—and, consequently, initial unit costs probably did not represent the minimums attainable—yet it is certain that only die casting could effect the large savings realized.

Before **you** schedule a manufacturing procedure, profit by ***consulting with us.*** We've helped many a producer to wash out high costs from his production picture . . . and obtain better products to boot! We'll gladly put our experience and facilities to work for you.



The Foremost Furnaces

for Melting any type of Non-Ferrous Metals in Foundries, Die Casting and Permanent Mold Plants



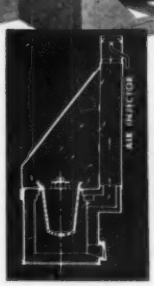
STROMAN MODEL "BFC" HAND TILT BARREL TYPE MELTING FURNACE FOR ALUMINUM

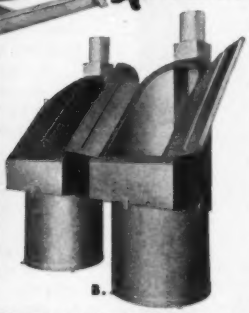
Featuring "Tangential Firing" which produces a most efficient combustion condition, creating a melting atmosphere that keeps metal loss and dross accumulation at a minimum. Charges through the top or rear door which is also used for drossing metal and cleaning the furnace. Built in 500 lb. capacity and larger. Oil or gas fire.

STROMAN MAGNESIUM AND ALUMINUM MELTING AND HOLDING FURNACES

A. Hydraulic Tilt Magnesium and Aluminum melting furnace handling from 500 to 3000 lbs. of aluminum. Incorporates the famous Stroman Stationary Lip Pour, which creates a constant pouring arc at any desired pouring speed. Saves time and metal.

B. Stationary Super-Heating or Melting Furnaces, Type S. F. Designed to deliver the correct super-heat to magnesium after it has been melted in larger furnaces, and before it is poured into the molds. Can also be used for breakdown or holding. They have all safety features. Are available for cast steel pots or fabricated steel pots. Furnaces may be equipped with hoods if so desired, for the venting of combustion and other gasses. Write for bulletin No. 100.

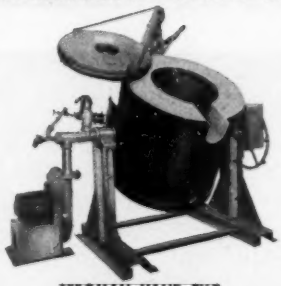




STROMAN IRON POT MELTING FURNACES FOR ZINC OR ALUMINUM

These furnaces are highly recommended as breakdown furnaces for zinc and aluminum die casting and permanent mold plants. They also excel as holding furnaces. They can be supplied either with or without hoods to exhaust fumes and heat. Their construction causes longest pot life and lowest fuel costs. Choice of automatic or manual controls and oil or gas fire. Capacities from 212 to 14,000 lbs. zinc.

Write for Bulletin No. 115



STROMAN HAND TILT CRUCIBLE MELTING FURNACE FOR BRASS, BRONZE, ALUMINUM AND OTHER ALLOYS

Capacities from No. 40 to No. 500 Crucible. Most efficient in operation. Rugged construction assures longest life and trouble-free operation. Oil, Gas or Combination Fire.

Write for Bulletin No. 105

STROMAN TYPE "MC" ALUMINUM DIP-OUT REVERBERATORY FURNACE

Bath capacity from 500 to 10,000 lbs. Aluminum

A combination of breakdown and holding furnaces makes this the most economical furnace ever designed for aluminum melting. It can be used for melting, holding, alloying, fluxing, for either casting or producing ingots. Cold metal does not reach the molten bath. Hot metal is always available for dipping. No iron pots or crucibles to buy. Oil, gas or combination oil-gas fire. Complete automatic controls are available if desired.

WRITE FOR COMPLETE CATALOGUE ON ALL TYPES OF FOUNDRY EQUIPMENT

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DIVISION OF

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Regular sampling and analysis assure conformance to definite composition limits . . . alloy used is proved to be "on grade."

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Send for a bulletin fully describing The CERTIFIED ZINC ALLOY PLAN, how it operates and what it means to the buyer

A & A Die Cast and Plastic Molds Co., West Los Angeles, Calif.
The Accurate Die Casting Co., Cleveland, Ohio
Advance Pressure Castings, Inc., Brooklyn, N. Y.
Advance Tool & Die Casting Co., Milwaukee, Wis.

Badger Die Casting Co., Milwaukee, Wis.

Central Die Casting & Mfg. Co., Inc., Chicago, Ill.
Cleveland Hardware & Forging Co., Cleveland, Ohio
Congress Drives Division, Tann Corp., Detroit, Mich.
Continental Die Casting Corp., Detroit, Mich. Division of F. L. Jacobs Co.
Crown City Die Casting Co., Pasadena, Calif.

Doehler-Jarvis Corp., Pottstown, Penna.
Doehler-Jarvis Corp., Toledo, Ohio
Doehler-Jarvis Corp., Chicago, Ill.
Dollin Corporation, Irvington, N. J.
Du-Wel Metal Products, Inc., Bangor, Mich.

Fanarc Manufacturing Co., Inc., Whittier, Calif.
Federal Die Casting Co., Chicago, Ill.

Glenvale Products Corporation, Detroit, Mich.
Globe Imperial Corporation, Rockford, Ill.
C. M. Grey Mfg. Co., East Orange, N. J.

Heick Die Casting Corporation, Chicago, Ill.
Hilfinger Corporation, Toledo, Ohio
The Hoover Company, North Canton, Ohio

Kamin Die Casting & Mfg. Co., Chicago, Ill.
Kiowa Corporation, Marshalltown, Iowa
Paul Krone Die Casting Co., Chicago, Ill.

Madison-Kipp Corporation, Madison, Wis.
Milwaukee Die Casting Co., Milwaukee, Wis.
Monarch Aluminum Mfg. Co., Cleveland, Ohio
Mt. Vernon Die Casting Corp., Mt. Vernon, N. Y.

New Products Corp., Benton Harbor, Mich.

Paragon Die Casting Co., Chicago, Ill.
Parker White Metal Co., Erie, Penna.
Precision Castings Co., Inc., Syracuse, N. Y.
Precision Castings Co., Inc., Cleveland, Ohio
Precision Castings Co., Inc., Reed Metal Crafts Division, Chicago, Ill.
Pressure Castings, Inc., Cleveland, Ohio

Racine Die Casting Co., Racine, Wis.

St. Louis Die Casting Corp., St. Louis, Mo.
Schultz Die Casting Co., Toledo, Ohio
Sterling Die Casting Co., Inc., Brooklyn, N. Y.
Stewart Die Casting Div. of Stewart Warner Corp. Bridgeport, Conn.
Stewart Die Casting Division of Stewart Warner Corp. Chicago, Ill.
Stroh Die Moulded Casting Co., Milwaukee, Wis.
Superior Die Casting Co., The, Cleveland, O.

The Tool-Die Engineering Co., Cleveland, Ohio
Twin City Die Casting Co., Minneapolis, Minn.

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Universal Die Casting Co., Los Angeles, Calif.

Wells Die Casting Co., San Francisco, Calif.
Western Die Casting Co., Emeryville, Calif.

AMERICAN DIE CASTING INSTITUTE, INC.
366 MADISON AVENUE NEW YORK 17, N. Y.

USCO K

USCO K Aluminum Alloy is one of several standard die-casting alloys of the AXS-679 Revision 3 type. USCO K and the other standard alloys in the K series are production controlled from raw materials to finished ingot under the most modern methods of alloying and refining—giving you the uniform mechanical and physical properties you desire in your castings. If you prefer, we can produce an aluminum die-casting alloy to your exact specifications.

The specifications on AXS-679 Revision 3 are broad. In USCO K the Si is kept at the maximum limit to insure fluidity. The detrimental elements—Mg, Fe, Ni and Cr—are kept at the low limit to combat die-cast sludge. Even the unspecified elements—Pb and Na—are kept at a trace to prevent soldering.

Our metallurgical engineers, who have a practical working knowledge of your problems, are at your service always.

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FREE Send for your copy of the USCO Aluminum Alloy Selector. A handy aid to analysis, specifications and many other foundry problems.

For 47 years, pioneers in aluminum development.

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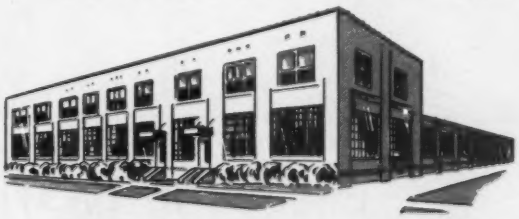

SCHULTZ DIE CASTING COMPANY
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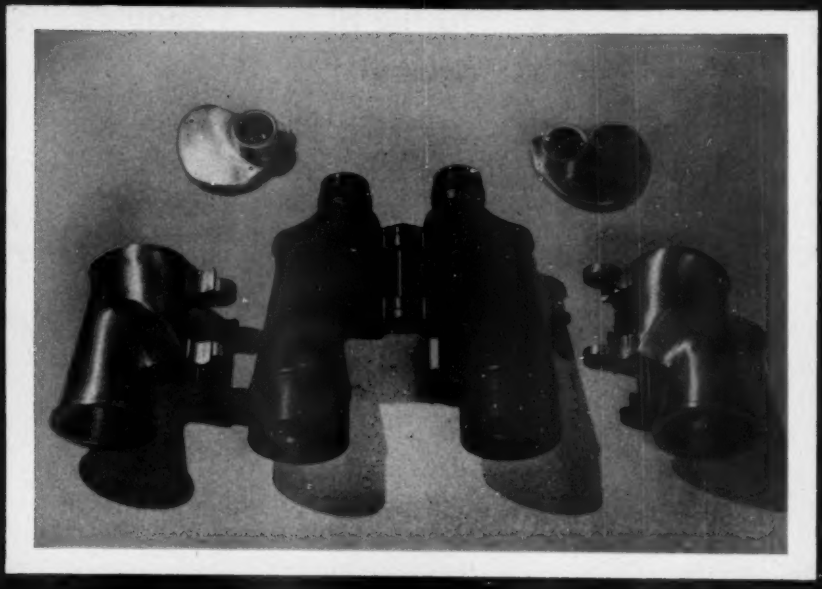

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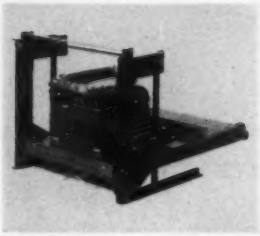
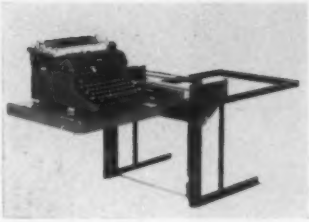
ZINC AND ALUMINUM ALLOYS

CLEVELAND 35, OHIO





1. TO LIFT A TYPEWRITER into position, this special device is built into office desks. Known as the Pedtype, it depends upon the tension of a coil spring adjustably mounted and controlled by three zinc die castings. Shown *above* and at *right* are the retracted and working positions of the device.

DIE CAST WORM AND HELICAL GEARING

PARTS which are mechanically simple in design may, nevertheless, present difficult fabricating problems. Three such parts are used in the spring tensioning device which is part of the typewriter lifting mechanism* manufactured by Stow & Davis Furniture Company, Grand Rapids, Michigan.

These parts perform their function with the simplicity which is a desirable feature of good product design. Yet it is doubtful that they could be produced economically by any other method if the die casting process were not available.

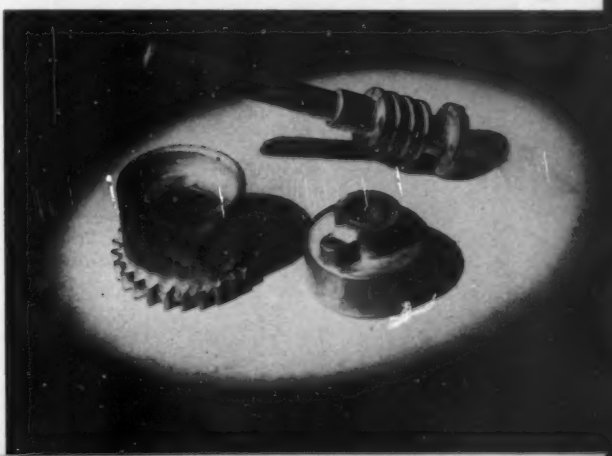
The mechanism provides an adjustment so that the typewriter lifting table, Figure 1, can be set to compensate for variations in the weight of different typewriters. Thus, for heavy machines, tension on the spring is increased, and for lighter typewriters, the tension is reduced so that the typewriter rises into position with a smooth, steady motion.

The coiled spring which lifts the typewriter with a controlled action, is held at each end by a cup-shaped retainer, one of which is stationary while the other can be rotated in either direction by means of a helical gear formed on its circumference. A crank-operated worm gear engages the teeth of the helical gear to make the desired adjustments.

The three parts included in Figure 2 are the spring retainers and the adjusting shaft with integral worm gearing. All

(Continued on Page 52)

2. A WORM GEAR ON A SHAFT and a helical gear on the outside of a drum-like shape are relatively simple to die cast, almost impossible to produce at low cost by any other method. There are very few secondary operations on these three die castings.



* Trade name for this device is Pedtype.

1. ONE-PIECE CONSTRUCTION OF THESE DIE CAST ALUMINUM WINDOWS HELPS TO REDUCE DRAFT SEEPAGE WHICH WASTES FUEL AND CAUSES COLD AREAS AROUND WINDOWS OF CONVENTIONAL WELDED CONSTRUCTION. LOW MAINTENANCE COST DUE TO CORROSION RESISTANCE OF ALUMINUM IS ALSO DESIRABLE.

Weather-Proof Windows Of Die Cast Aluminum

INFILTRATION of air through and around conventional welded metal casement windows can cause a marked increase in fuel expenditures in small homes. When the number of windows is large, as in an office or apartment building, this loss of heating efficiency can assume serious proportions.

The presence of cracks and joints and the lack of uniformity of jig-welded fixtures creates a problem in sealing and results in cold areas around windows.

As a remedy for this situation, the Lea-Bachman Manufacturing Co. of Los Angeles has introduced a new type of casement window which is made up of aluminum die castings.

Extensive development work by the die caster and the manufacturer was required to produce these castings, because of the unusual sizes and shapes.

The new type casement window has important structural and functional advantages, many of which can be traced directly to the choice of material and the fabrication method.

For example, the unitary construction made possible by die casting the frame and ventilator instead of fabricating it from a number of strips of metal has been a factor in eliminating draft seepage.

The choice of aluminum as the die casting alloy has provided a corrosion-resistant surface that does not require painting.

Installation and maintenance costs are demonstrably lower than those for windows fabricated by other methods and from other materials.

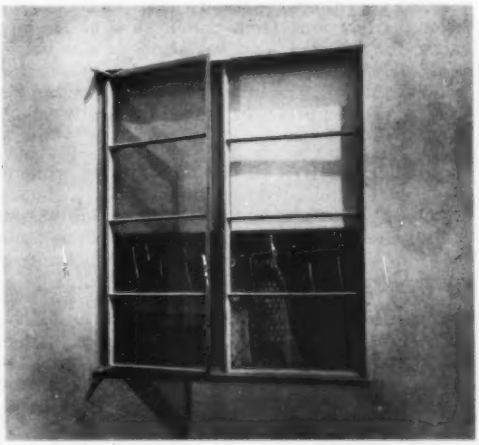
Casement windows are usually installed in large numbers, principally in multiple unit dwellings such as apartment buildings or urban developments, or in office and industrial buildings. The predictable volume in which casement windows are used has appeared to be sufficient to promise reasonable amortization of high tool costs.

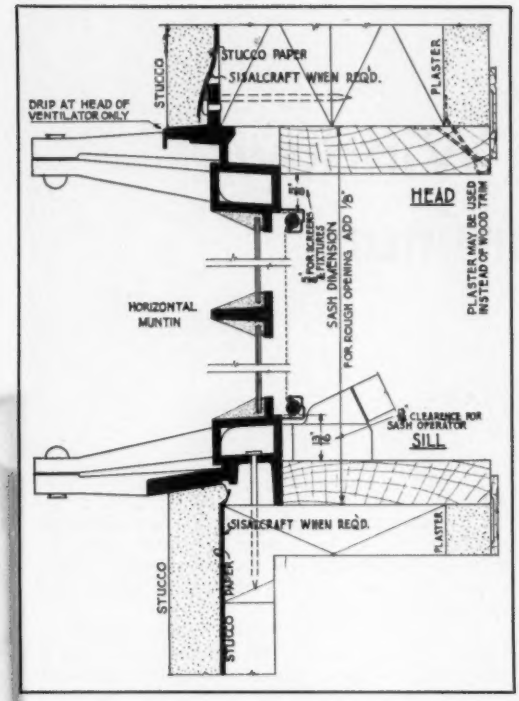
The large volume usage of die cast casement windows has, of course, been predicated upon certain specific advantages die cast aluminum possesses in comparison to conventional fabrication methods and materials.

The die cast casement unit, shown installed in Figure 1, offers many attractive features to architects and builders. These include the following points:

1. TWENTY-FOUR BASIC DIE CASTINGS are assembled in various combinations to give a very large number of types and sizes of windows.

2. READY TO INSTALL, these die cast windows have integral outside sill, plaster ground and hinges so that minimum labor or time is needed to mount them in the window openings.





3. DETAIL DRAWING SHOWING MANNER OF INSTALLING these die cast aluminum windows reveals the simplicity with which the job is accomplished by nailing to studs.

This allows the architect a large selection of the product for any particular application—always a valuable sales point.

2. COMPARISON OF WEATHER-SEALING EFFECTIVENESS between the die cast window and those fabricated by other methods shows a marked advantage for the die cast product. The hot-rolled sections from which steel sashes are made, for instance, have variations in size which require fitting operations in order to make the windows tight. The inherent accuracy of the die casting process produces parts in quantity which are uniform in size.

3. MACHINING OF PARTS for the window is largely eliminated by die casting, a factor which is important in the determination of the sales price. The only machining which is done on these windows is flash removal and tapping of cored holes for hardware and glazing clips.

4. ALUMINUM ALLOY FORMS A THIN, PROTECTIVE OXIDE that seals it from further reaction. There is no need for painting the windows, either during installation or for subsequent maintenance, unless exposure to the ocean's salt atmosphere is anticipated.

5. UNSIGHTLY WELDED OR RIVETED CORNER JOINTS and assembly jigs have been eliminated by the die casting process. The outside sill, plaster ground and hinges are integral parts of the window frame. These parts would cause a troublesome and costly operation if the window were made up of extrusions. The company estimates the cost of an extruded section as the same as a complete die cast window. Not only is the fabrication cost eliminated, but a more rigid frame is obtained.

6. REMOVABLE STOP-OFF CORES allow left- and right-hand windows to be produced from the same die.

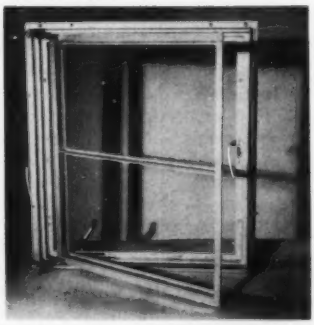
7. AN INTEGRALLY-CAST FLANGE on the head and jambs of the frame allow the window to be nailed to the outside of a rough 2" by 4" wooden wall or easily inserted in a masonry or brick construction. The flange is then covered over on the outside, and on the inside, the plaster can be carried directly to the edge of the window. The high cost of skilled construction labor makes this a very desirable feature.

8. ASSEMBLY OF THE WINDOW IS SIMPLIFIED wherever possible by the use of aluminum rivets. The hinge pins are aluminum rivets, which are peened over after insertion.

Dimensions of the largest frame now being die cast are 6'-4⅜" by 1'-10⅞". Even with this unusual size, the company has had no trouble with warpage. They had, at first, trouble in filling the die and other difficulties, but these have been overcome. A special machine is now under construction to handle frames up to 30 inches wide and 64 inches high with an approximate weight of 25 pounds.

Although the initial investment in die casting dies was high, the desirable product which derived and the large quantities in which this item is used have completely justified that investment. These windows may well pave the way for many other die cast products in the construction field.

4. TWO DIE CASTINGS, consisting of a frame and ventilator, make up the window unit. These large-area, flat die castings are difficult to produce due to problems in filling the die and maintaining flatness upon ejection. High initial tool costs for 24 different sizes could only be justified by high volume output.



SYLVANIA RETAINS PRODUCT DESIGNERS

Sundberg - Ferar, industrial designers, has announced that the firm has been retained as design consultants by the lighting division of Sylvania Electric Products, Inc.

Sundberg-Ferar will collaborate with Sylvania on the products manufactured by the lighting division, including lighting fixtures and equipment, as well as design development work on various new products.

NORTON BUILDS NEW PLANT

An expansion plan costing $6,000,000, increasing the Norton Co.'s capacity to make grinding and lapping machines, was announced recently by Milton P. Higgins, president of the company.

A 6½-acre plant will be erected on Brooks Street in Worcester, Mass. The new plant will provide 275,000 square feet of working space plus a 360 by 100 foot office building. Much of the equipment will also be new, according to the company announcement.

AUTO-LITE EXECUTIVES RECEIVE PROMOTIONS

Promotion of two officers of The Electric Auto-Lite Company and the election by the Board of Directors of a new vice president have been announced by Royce G. Martin, president and chairman of the Board.

Byron A. Fay, a director and vice president in charge of manufacturing, was elected vice chairman of the Board. In this post, he joins D. H. Kelly, also a director, vice chairman of the Board and vice president.

H. E. Hasemeyer, vice president, has been named executive vice president. Joseph H. Lambrix, who has been in charge of purchases, has been named vice president and director of purchases. Both Mr. Kelly and Mr. Fay are veteran officers of the company. Mr. Kelly has been with Auto-Lite and predecessor companies since 1919, Mr. Fay since 1920.

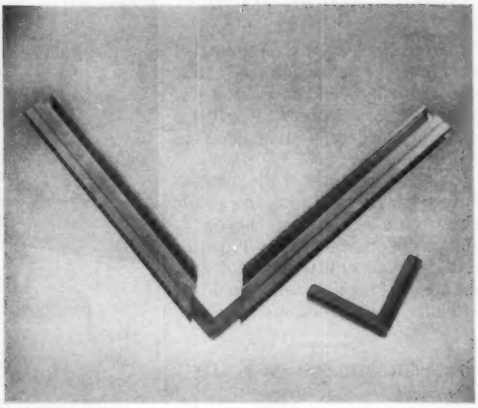
Held to Close Tolerances in DIE CAST Gear Housing for Signal Electric Fans

The die cast gear-case and cover pictured above are used in several models of Signal Electric Fans. The use of die castings in this application has been an important factor in keeping costs in line, and in the performance of the fan assembly.

One problem in die casting this gear housing is the need for extremely close tolerances (.002 of an inch) in the cast-in holes for the gear shafts. Casting these holes eliminates two precision boring operations, cuts assembly time, and reduces overall costs.

According to the customer, Milwaukee Die Castings are specified for this gear-case and cover because they have proved highly satisfactory over a period of years. You, too, can count on *Milwaukee* for die cast parts that will contribute to the excellence of your product.

MILWAUKEE DIE CASTING COMPANY
1019 N. FOURTH STREET • MILWAUKEE 3, WISCONSIN



THIS UNIQUE METHOD of securing miter joints of aluminum extrusions depends upon the ductility of zinc alloy. Although the angle piece is not complex in shape and could be formed by other methods, the large quantities required made die casting the most economical method.

A NEW METHOD OF

JOINING MITERED EXTRUSIONS

A COMPARATIVELY recent development in the construction field is the utilization of prefabricated metal doors, windows and trim to speed work on the construction site.

Many of these products are built up of aluminum extrusions, since aluminum has good weathering properties, is stronger than wood, permitting reduced section thickness, and has a good appearance without surface treatment.

In making extruded aluminum window and door frames, Alsco, Inc., of Akron, Ohio, was confronted with the problem of obtaining a corner joint that would not mar the appearance of the frame and would be sufficiently strong. The problem was solved by using miter joints with the holding action accomplished with internally placed zinc die cast angles.

LIGHT, STRONG AND WEATHER-RESISTANT, aluminum screen and storm doors and windows are finding increased acceptance among home owners. Die castings have given this company's products strong yet unobtrusive corner joints.

These angles, 1/4 by 3/16 inch in cross section and measuring 1½ inches along each arm, are hand fitted into each of the frame members to be joined. The extruded frame members have a grooved slot just large enough to receive the angle. The parts are held in place either with drift pins or by peening the aluminum into the zinc angle.

Large quantities of these angles are required to maintain production. This fact, together with the ductility of the zinc alloy which makes peening a satisfactory joining method, was instrumental in bringing about the company's choice of die casting for this part. When the frame is assembled the die cast angle is completely hidden from view. The resulting joint is smooth, rigid and strong enough for all practical purposes.

MURRAY-WAY CORPORATION OCCUPIES NEW PLANT

Marking its third expansion since the founding of the firm in 1940, the Murray-Way Corporation moved into a new plant located on Maple Road, east of Birmingham, in Detroit recently.

The company will use it enlarged facilities for the production of standard polishing and buffing heads, automatic conveyors for polishing departments, and automatic Micro-Polish equipment for polishing flat metal sheets, rolls or blanks before forming.

Officers of the corporation include: Ernest E. Murray, president; Donald M. Teer, vice president; Roman J. Zech, secretary; and Robert J. Gilmore, treasurer.

ANNOUNCE SPRAY PAINTING CLASS SCHEDULE

A schedule of free classes in industrial spray finishing methods at the School for Spray Painting operated by the DeVilbiss Co., Toledo, Ohio, has been announced. Users of DeVilbiss equipment may make application now to enroll their spray operators, shop superintendents and service managers for any of the one-week courses scheduled.

Instruction periods begin on each of the following dates: July 16, August 13, September 17, October 15 and December 10.

ASTM GIVES AWARDS FOR TECHNICAL PAPERS

Authors of outstanding technical papers presented at previous meetings of the American Society for Testing Materials received awards at the 1951 ASTM annual meeting during the week of June 18. The authors and papers recognized are as follows:

Charles B. Dudley Medal—to Professors D. S. Clark and P. E. Duwez, California Institute of Technology, for their paper entitled "The Influence of Strain Rate on Some Tensile Properties of Steel," presented at the 1950 annual meeting.

Richard L. Templin Award—to R. L. Templin and W. C. Aber, Aluminum Company of America, for their paper entitled "A Method for Making Tension Tests of Metals Using a Miniature Specimen," presented at the 1950 annual meeting.

Sam Tour Award—to C. T. Evans, Jr., The Elliott Co., for his paper entitled "Oil Ash Corrosion of Metals at Elevated Temperatures," presented at the 1950 annual meeting.

Sanford E. Thompson Award—to R. C. Mielenz, L. P. Witte and O. J. Glantz, U. S. Bureau of Reclamation, for their paper entitled "Effect of Calcination on Natural Pozzolans," presented at the Pacific area national meeting in October, 1949.

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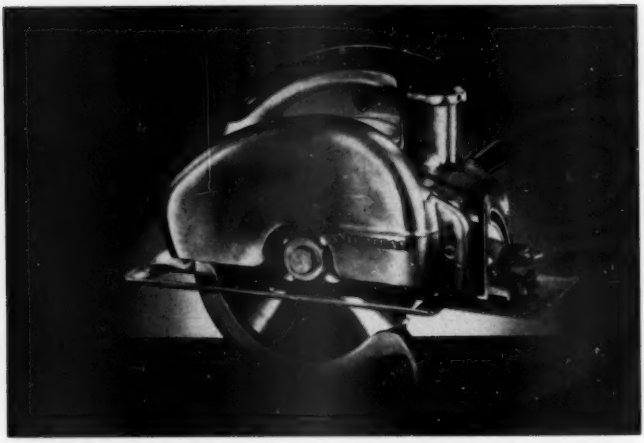
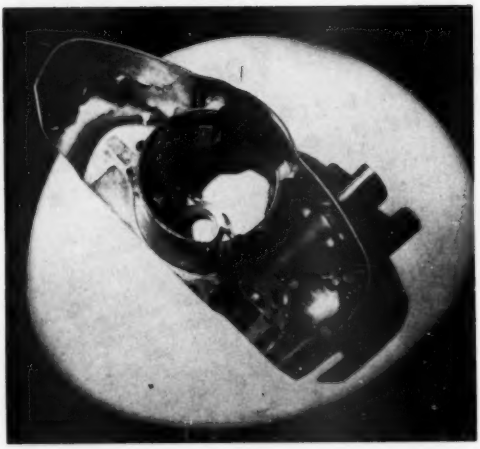




1. APPEARANCE requirements are satisfied by the use of satin finished aluminum die cast housing.

2. STRESS - RESISTANCE is obtained by this die cast motor frame which withstands torque, vibration and loading stresses.

APPEARANCE, ease of handling, safety in operation, durability and weight are all considerations that must enter into the design of any portable electric tool. These conditions have caused manufacturers of such tools in general to rely on the die castings process for major components of their products.

The American Floor Surfacing Machine Co. has for several years manufactured a portable electric saw. As the sales volume of this product increased, all major functional parts were changed from magnesium sand castings to aluminum die castings.

Elimination of much machining and a better exterior appearance were the reasons for the change. The large number of machining operations necessary to provide locating surfaces and alignment of the parts made for a high manufacturing cost and the polished magnesium surface could not be maintained. Lacquer was tried in an effort to overcome oxidation of the surface, but when the lacquer was chipped off in service, the exposed metal turned a dull gray.

The die castings now used require a minimum of machining for surface location and alignment, and the exterior parts stay bright after being polished.

The American portable electric saw is designed for use by

DESIGN OF A PORTABLE TOOL

By C. C. MONROE
Chief Engineer
American Floor Surfacing
Machine Company

contractors, builders and maintenance men. It has an 8½" circular saw blade. Depth of cut is adjustable to a maximum of three inches vertically, and the angle of cut is adjustable to 55 degrees.

The depth of cut is regulated by turning a knurled knob at the front end of the handle. This turns a brass 20° Acme triple thread screw, which moves the base plate up or down until the saw blade projects the desired distance from the bottom of the base plate. Angle of cut is adjusted by loosening the lock lever on the front of the protractor scale and moving the saw to the desired angle.

The die cast parts constitute the majority of the components of the saw. They include the motor frame, the frame end cover, the handle, the upper and lower saw guards, the gear housing, gear housing cover, the elevating knob, the elevating bracket, elevating bracket hinge, the scale bracket and the locking handle.

While some of these parts are conventional and almost standard in design approach, the others are an interesting example of what can be accomplished by close cooperation between the manufacturer and the die caster.

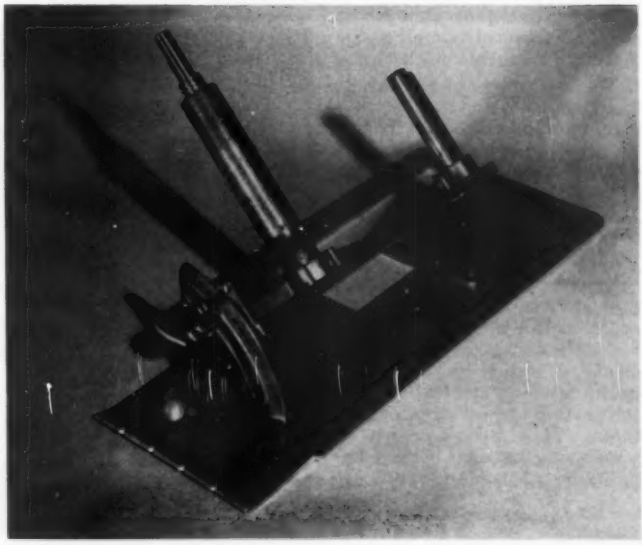
Net effect of this cooperation has been the elimination of much machining. Cored holes and bosses have been arranged to give maximum ease of assembly. Most important has been the small amount of machining necessary to meet concentricity and alignment tolerances on locating and holding surfaces for the motor and saw shafts.

The special design General Electric motor develops 2-⅛ hp. It drives the saw blade through a gear train at a speed of 5300 rpm. Obviously, any misalignment at this speed would cause serious vibration. Ten different surfaces in three die castings affect the alignment of the saw and motor shafts.

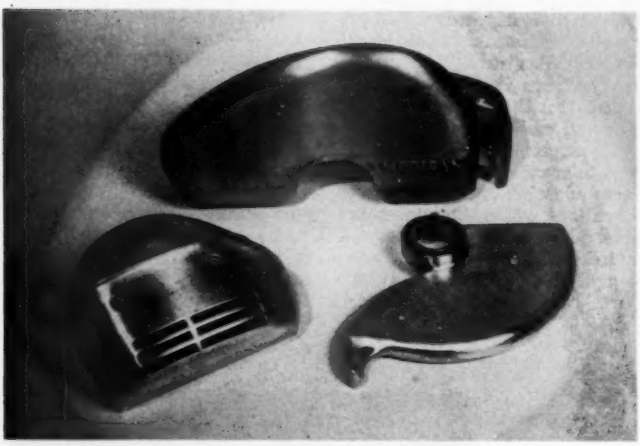
To expect the die caster to hold tolerances on these ten surfaces close enough to prevent vibration would be unreasonable. If the die caster is consulted in such a case, however, it will often develop that the parts can be designed in such a way as to keep machining to an absolute minimum.

Consider the motor frame, shown in Figure 2. The thin shell had to be designed with an appearance standpoint in mind, since it constitutes part of the outer cover of the saw. The part must also bear a large part of the stresses during operation, since it contains the motor and the elevating mechanism which holds the saw body to the base plate.

3. CENTER RELATIONSHIPS can be held relatively close by coring so so that the critical bearing surfaces of the gear housing and gear housing cover can be sized and located with few machining operations.



4. ENGRAVING IN THE DIE saves money on the protractor scale which is an integral part of the scale bracket. This mechanism is heavily ribbed for strength since it is used for elevating and holding the entire saw.



5. POLISHING WITH SET-UP WHEEL followed by wire brushing gives an attractive surface finish. Flash is first removed with emery wheel or abrasive belt.

An arm projecting from the exterior side of the frame holds the two brushes and one end of the motor shaft. The brush holes and the shaft opening are bored for alignment and the inside surface of the arm is faced to make it vertical to the centerline of the shaft. Four pads on the interior of the circular motor housing serve to locate the motor field. These are also faced and the inside diameter of the end of the housing is turned. These operations, together with tapping some of the cored holes, constitute all of the machining on this part.

The main body of the saw is located and held to the base plate through the motor frame. Two lugs on one side of the circular section of this part slide on a post on the elevating frame. The integrally cast tube fits over a steel post pressed into the elevating frame.

Examination of Figure 2 will give an idea of the complexity of the die for this part. Irregular parting lines have been used on this as well as on other parts in the assembly in order to keep the parting line off exterior surfaces. This allows assembly without grinding down and polishing flash marks.

The motor frame has proved to be rigid enough to stand all the stresses of service without dimensional distortion. The ribs on the side of the circular motor housing serve to strengthen the housing and also provide points for ejector pin contact.

The gear housing, Figure 3, contains the other end of the motor shaft, the gear train and one end of the saw shaft. This part must be aligned exactly with the motor frame.

The diameters are turned and the outer surface faced, and no other machining is necessary on this part. All holes are cored and only the grease supply passage is tapped to allow the grease gun fitting to be inserted.

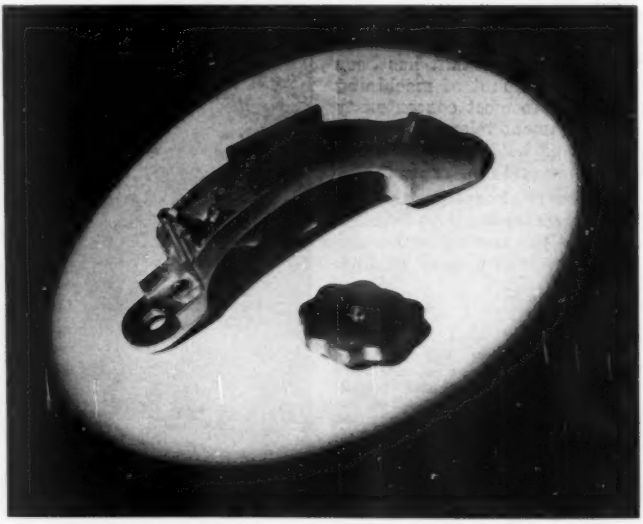
The arc in the gear housing directs the flow of grease and prevents the grease being churned between the gears. Interlocking cores from both sides have been utilized to form an undercut in the passage for the motor shaft and the pinion. The elongation at the side of the part carries air from the motor fan and directs it across the path of the saw blade in order to assure visibility.

The gear housing cover, also shown in Figure 3, positions the saw shaft by means of a bearing. A facing and a turning operation are performed on this part. All holes in the cover are cored and self-tapping screws secure the cover to the gear housing. The hole in the center is tapped to receive the lower saw guard retainer.

The elevating bracket, scale bracket and hinge are shown

(Continued on Page 53)

6. HANDLE WITH BUILT-IN CONTROLS and adjusting knob are an important use for die cast aluminum because of the economy which is possible.



LITERATURE AND SERVICES

(Continued from Page 8)

No. 27. A COMPACT, COMPLETELY AUTOMATIC DRILL HEAD with self-contained air and controlled feed and speed is described in a catalog offered by the Dumore Co.

No. 28. BLACK OXIDE COATINGS are the subject of Bulletin MB-3, offered by the Mitchell-Bradford Chemical Co.

No. 29. CASE HISTORIES and other information on backstand belt grinding and finishing with 3M equipment is offered in a booklet published by the Minnesota Mining & Mfg. Co. The booklet also tells about the 3M survey service for converting present equipment.

LETTERS TO THE EDITOR

(Continued from Page 4)

SELECTION OF CUTTING FLUIDS

Mr. R. I. Mahan wrote an article entitled "Factors in Selection of Cutting Fluids" which appeared in two parts — your May and June, 1946 issues.

If you have reprints of these articles, I'd appreciate receiving them. Otherwise, I would appreciate the tear sheets. Also, if you have a list of articles which have appeared in your magazine dealing with the subject of cutting fluids, could you send it to me?—C. A. S.

Tear sheets forwarded.—Ed.

CIGARETTE DISPENSER AND COIN BANK

We note with interest your article on page 21 of your May issue, "Realistic Detail by Die Casting" regarding the combination despenser and coin bank manufactured by National Automatic Products Company. Will you kindly furnish us with their address or forward our request to them for photos and prices of this item?—B. L. W.

Information forwarded.—Ed.

APPOINTED BY FEDERATED

R. A. Gloss has been appointed sales representative of the Wisconsin and upper peninsula Michigan territory of Federated Metals Division, American Smelting and Refining Company.

Mr. Gloss has been with Federated for a year undergoing sales training at the company's Whiting, Indiana plant. He will work out of Federated's district sales office at 756 North Milwaukee Street, Milwaukee, Wis.

HELI-COIL ELECTS NEW VICE-PRESIDENT

The Heli-Coil Corporation of Long Island City, New York manufacturer of helical-wire thread inserts, announces the election of Eugene M. Lang to the position of vice-president in charge of manufacturing. Mr. Lang, former works manager at the Heli-Coil plant, has served the firm in various executive and production capacities since 1941.

Prior to this, he was a management consultant to chemical and metal-fabricating firms and an industrial analyst for several trade publications. Louis K. Rimer, former vice-president in charge of operations of Elgin American Company, Elgin, Illinois, succeeds Mr. Lang as works manager and has been elected assistant secretary of the corporation.

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SMALL AIR CYLINDER DESIGN

ONE of the most versatile little power packages to make its appearance in some time is the small, single acting air cylinder introduced by The Bellows Company, of Akron, Ohio, to round out their line of air motors, cylinders and accessories.

This small unit, called the Han-D-Air Cylinder, is designed in such a way that it can be mounted in almost any desired position: horizontally, vertically, side, front flange, rear flange or front pivot mounted. It is especially suited for the mounting of multiple installations in cramped quarters.

To produce such a flexible unit at low cost, Bellows engineers have utilized the fabricating advantages of the die casting process. Front and rear heads of the cylinder are die cast in an aluminum alloy.

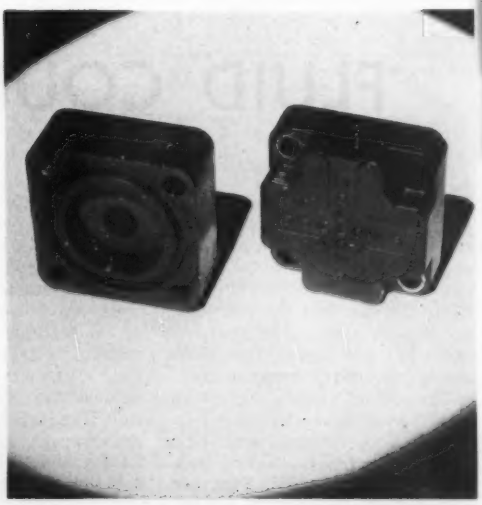
1. VERSATILITY of this small air cylinder is due in part to the cored holes in its die cast front and rear heads which permit the unit to be mounted in many different positions.

An air cylinder which can be mounted in several ways must have a number of mounting holes in addition to the holes for air connections; in the Han-D-Air cylinder these are cored through the die castings, thus saving the drilling operations which would otherwise be required.

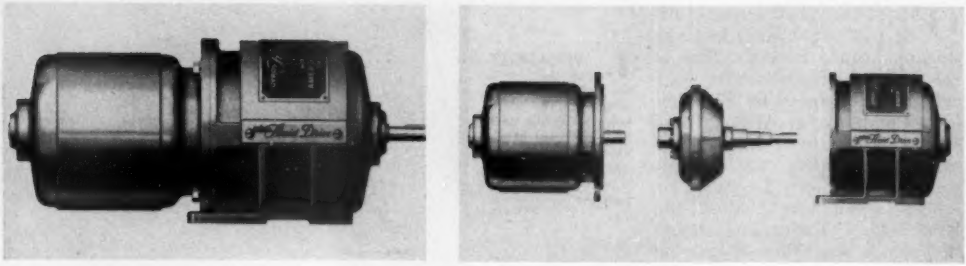
A Use of Die Castings In Hydraulic Equipment

Due to the accuracy of size and location possible by coring holes, very little machining is needed by these two die castings. The seats for the two ends of the brass cylinder are formed

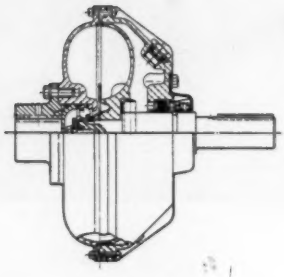
(Continued on Page 54)



2. BLACK ANODIZED aluminum makes a durable, corrosion-resistant and attractive finish for these die cast heads.



1. FLUID COUPLING is available either as a separate unit, or as a part of a complete hydraulic electric power package, *above left*. An exploded view of the package unit is shown at *right*.



2. ALL MAJOR STRUCTURAL PARTS of the fluid coupling are die cast in aluminum. Section drawing, *above*, reveals the relationship of impeller mounted on the motor drive shaft, and the runner (or driven member) enclosed within an outer casing.

FLUID COUPLING DESIGN

SEVERAL methods are used by American Blower Corporation in Detroit to produce the driving and driven members of their small (1 to 20 horsepower) types T and TM Gyrol Fluid Drives. For the two high-production sizes, aluminum die castings are used for three major structural components.

The Fluid Drive, available either as a separate unit, Type T, or as an integral part of a complete hydraulic-electric power package, Type TM, Figure 1, uses a cushion of oil to provide smooth acceleration, protection against overload, and shock absorption, while requiring low starting current.

The Gyrol Fluid Drive transmits power solely by a vortex of oil, with no mechanical connection between the motor and the driven machinery. To achieve this, a type of construction illustrated by the sectional drawing, Figure 2, has been designed, with major structural components consisting of an impeller mounted on the motor drive shaft, the runner mounted on the shaft of the driven machine, and an outer casing to enclose the runner.

Two of these three die castings are especially difficult to produce since they consist of a large number of radial vanes, each vane having a wall thickness of approximately .090 arranged around a bearing hole inside of a circular shell.

The problem of getting the metal to flow through and fill

side gated to improve the flow of metal around the shell and into the fins. This leaves some excess metal to be removed from the runner by turning the OD, but very little other machining is required.

By comparison, experience by American Blower Corporation when these parts are sand cast it is necessary to machine the driven member all over on the outside surfaces and to balance them. Vanes on the sand cast unit cannot be kept uniform in thickness or spacing, and the wall variations vary in production as much as 1/32", necessitating considerable machining.

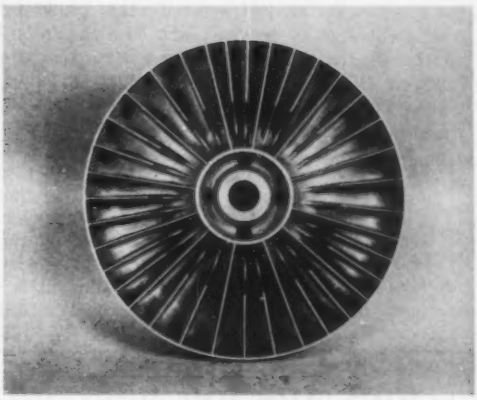
The die castings require neither static nor dynamic balancing, but can be used as received and normally machined.

A Use of Die Castings In Hydraulic Equipment

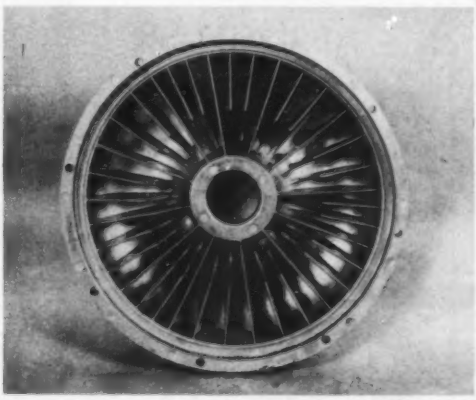
Bolt holes for assembling the impeller and outer casing are cored, as is a dimple to locate the drilling of the oil filler plug tapping. Because this hole is located at an angle with the die parting, it is less expensive to drill than to attempt to core it, but the cored dimple involves no undercut and assists in locating the hole for drilling.

As mentioned above, sound castings are essential for this application. Although internal pressure experienced in the Fluid Drive is low, slippage in excess of the three per cent calculated in the design of the unit would tend to build up heat and pressure. To withstand any possible stresses arising from such a cause, sound metallurgical structure is required.

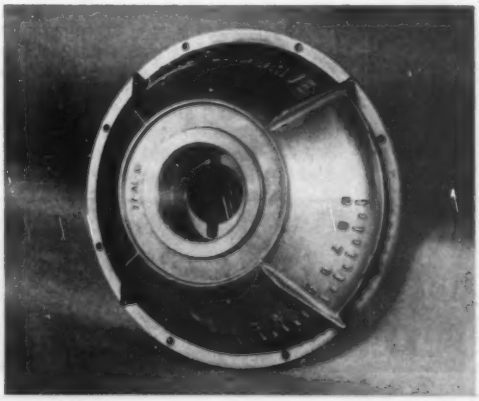
There is no corrosion problem, inasmuch as the aluminum alloy used is resistant to the fluids employed. The alloy chosen for



3. UNIFORMITY OF DIE CASTINGS makes possible thin-walled, accurately spaced radial fins of the runner (driven member) of the fluid coupling, *above*. Dynamic balance is satisfactory as cast without machining or balancing operations.



4. ELIMINATION OF EXPENSIVE MACHINING has been a feature of these die cast parts, such as the impeller, *above*. Two sizes of fluid couplings are now die cast with great economy.



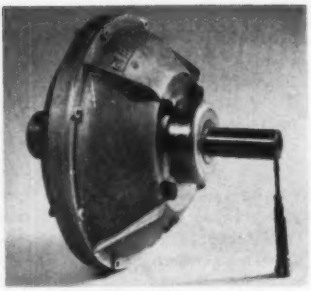
5. HOUSING FOR THE RUNNER is bolted to the impeller flange, using cored bolt holes. Company trademark and an indicator for determining level of fluid inside the coupling, are all cast integrally.

the complex die cavity required considerable skill on the part of the die caster because the function of the Fluid Drive makes it essential to have sound, well-filled castings.

The impeller and runner are its castability in thin section is a silicon-copper alloy designated ASTM B85-46T (SC6).

The die cast impeller and runner require little machining, fitting and adjusting because of the uniformity and accuracy which can be held. Because the same die caster has the dies for mating parts, he is able to inspect castings during production to assure accurate fit, and to make whatever changes in casting or die setup are needed.

Another important factor in the experience of American Blower Corporation with die cast rotors has been that there is very little scrappage due to porous castings.



6. TO WITHSTAND INTERNAL PRESSURES built up by calculated slippage, sound metallurgical structure is required.

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ELECTROCHEMICAL SOCIETY HONORS NBS

At the 99th convention held in Washington, D. C., recently, the Electrochemical Society honored the National Bureau of Standards. Meeting in conjunction with the NBS 50th anniversary, a scroll congratulating the Bureau on its 50 years of scientific progress was presented by the Society's president, Dr. Charles L. Faust, to Dr. E. U. Condon, NBS Director. The scroll reads:

The Electrochemical Society, Incorporated, entends greetings to the National Bureau of Standards upon the occasion of the Bureau's fiftieth anniversary 1951. Congratulations upon the Bureau's outstanding accomplishments in science and engineering, its fundamental research and its applied research and development in the physical sciences; its development of scientific standards of measurement and services related thereto needed by science, industry, commerce, Government and the public of the United States; its pioneering studies of the properties of materials and of physical constants; its splendid achievements in developments critical to the National defense; its contributions to economy in the operations of the Government; and presents this scroll on this 9th day of April in the year 1951 at the annual meeting of the Electrochemical Society, Incorporated, held in Washington, D. C., in recognition of the fiftieth anniversary of the Bureau of Standards.

FINISHING DIE CASTINGS

A SECTION DEVOTED TO THE FINISHING PROCESSES

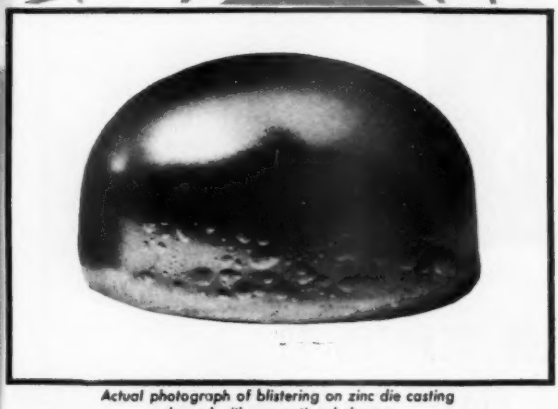
MACHINING—Most die castings require some machining operations. In this section will be found information to aid in planning and selecting the proper method and equipment for these operations.

ASSEMBLING—Die castings are generally assembled components. This section includes information on fastenings and methods for mass production assembly operations.

SURFACE FINISHING—Most die castings receive some type of surface finish such as plating, organic coating, anodic coating or chemical coating. This section contains information on the methods, processes and equipment used for the various surface treatments on the die casting alloys.

STOP BLISTERING, STREAKING

ON ZINC BASE DIE CASTINGS!



Actual photograph of blistering on zinc die casting cleaned with conventional cleaner.

Designed especially for reverse current electro-cleaning of zinc base die castings prior to electroplating, new Diversey No. 505 completely, safely removes all unwanted deposits! In addition, Diversey No. 505 conditions the surface of the zinc, providing better adhesion between the electro plate and the base metal!

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PRODUCTION CLINIC
for finishing die castings

A monthly digest of current technical progress selected and prepared by the editorial staff of DIE CASTINGS. This section is devoted to finishing processes for all types of die castings, and is written specifically for the benefit of the production man.

NECKING TIPS FOR TRACER BULLETS

MACHINING ORDNANCE DIE CASTINGS

MAINTAINING precision with mass production quantities can be a knotty problem, and work for the Ordnance Department and other military agencies fits into this category. This month's Production Clinic gives three illustrations showing how to speed machining while maintaining accuracy on die cast parts. One answer, of course, is making the machine completely automatic, and the photo on the next page illustrates a "home-made" machine that has worked out well. It may well pay you to look over your machines with an eye to stepping up production with automatic controls.

By BERNARD BETTER
Research Director,
Scully-Jones Co.

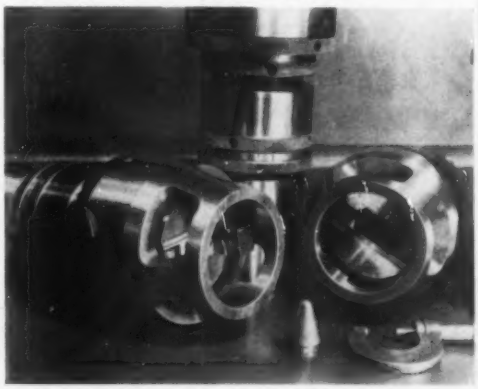
Tracer bullets are used by the armed forces in automatic weapons to check and correct the aim of the gunner. Used in a proportion with standard bullets of one to ten, they leave a trail of smoke by day and a readily-visible flame by night.

Since proper aiming depends upon accurate trajectory, perfect balance in the die cast bullet tips used by the Navy is considered essential. Although this article is concerned with materials used in World War II, problems similar to this are being encountered by engineers today.

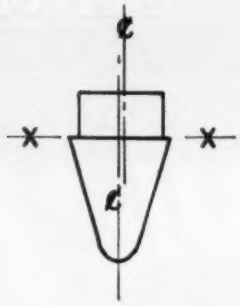
In producing die cast bullet tips, a manufacturer found that the parts were not in balance because of a slight shift in centerlines, shown in Figure 2. Uneven heat distribution had caused the dies to shift slightly in relation to one another.

In addition, when the bullet tips, cast 11 per gate, were cut from the web with a sprue cutter, part of the gate remained on the casting, together with the flash at the parting line.

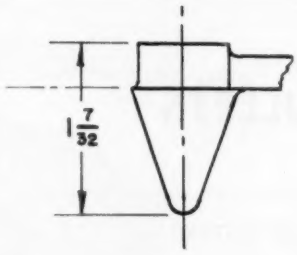
The Scully-Jones Co. was asked to design a high-produc-



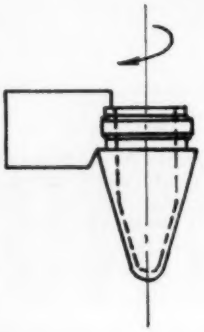
1. TOOLS FOR NECKING BULLET TIPS are shown here, together with one of the finished die cast parts.



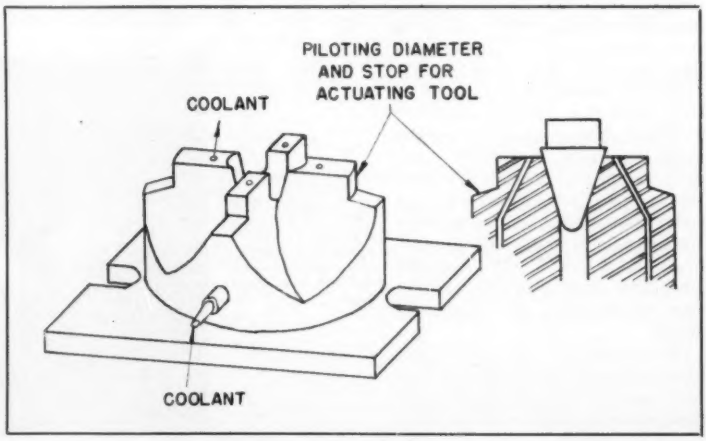
2. DIFFICULTY IN HOLDING CENTER LINES between cover and ejector halves of the 11-cavity die made it necessary to machine the castings for accurate balance.



3. DIMENSION ACROSS THE DIE PARTING is also difficult to hold within the required tolerance limits.



4. TO CUT THE NECK, the tool is rotated and the part is held stationary. Tungsten carbide tools proved to be hard to sharpen so that they were replaced with high speed steel bits.



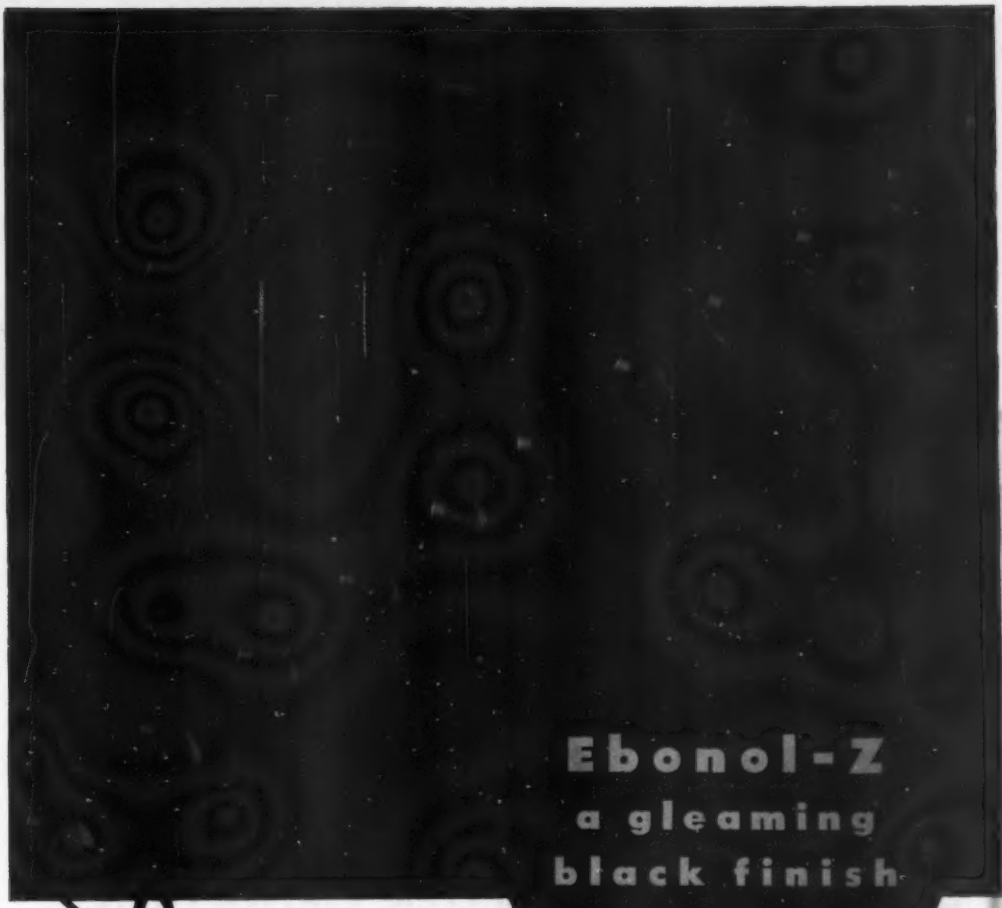
5. SKETCH OF ONE OF THE TOOLS. Five such tools were produced, so that by turning out between 800 and 900 parts per hour on a three-shift day, the required number of pieces could be finished.

tion tool for use on a single-spindle drill press which would machine this rough part in one operation, correcting the inaccuracies and holding the part to size so the succeeding threading operation could be accomplished.

Between 800 and 900 pieces was estimated to be the hourly rate which could be obtained from one tool. It was then decided that five such tools, operating on a three-shift-per-day basis, would produce the quantity of parts which the manufacturer was required to furnish on his contract.

An actuating tool was designed which had a shank that would fit over the end of the machine spindle in such a way as to allow an air-operated hold-down rod to pass through the spindle. A locating and holding fixture, Figure 5, was also designed.

Five tools like the one shown in Figure 4 were built and equipped with tungsten carbide form cutter. The carbide cutters proved difficult to sharpen, so they were replaced by high speed steel tool bits. The steel bits were found quite satisfactory, and could be used continuously for 24 hours before needing sharpening or replacement.



Beautiful, jet-black, like polished Ebony

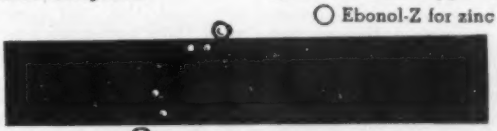
These zinc automobile door handles are typical of the products processed in Ebonol-Z. This simple, one-dip method imparts to zinc base diecastings and plated parts, a rich, adherent black coating with good weathering qualities. Parts need only to be cleaned and then treated for a few minutes in a warm solution of Ebonol-Z. Chemical cost is one-half cent per square foot of the area coated . . . cheaper than plating or painting. Now used for finishing war materiel, and typewriters, business machines, toys, cameras, radios, name plates, buttons, and buckles.

Samples processed in our laboratory.
Detailed procedures supplied without obligation.

○ Ebonol-S for steel
○ Ebonol-C for copper and brass
○ Ebonol-Z for zinc

Write for check list . . .

Sixty Products and Processes for Metal Finishing



442 Elm Street, New Haven, Conn.

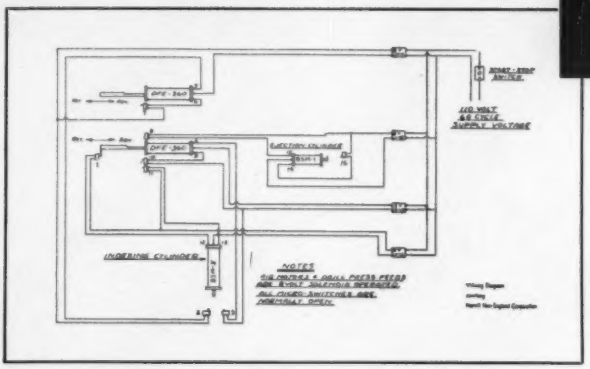
Circle No. 24 on Reader Service Card for more information

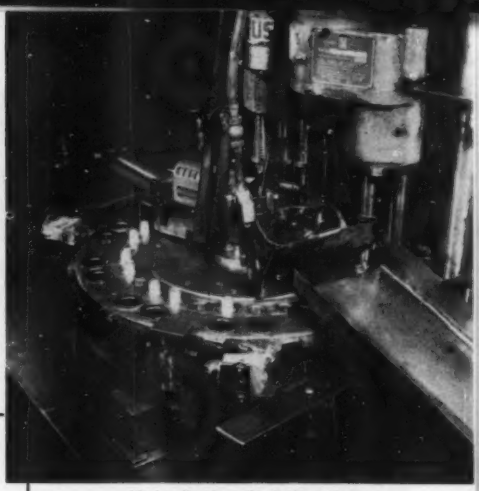
SEQUENCE OF AIR MOTOR OPERATIONS FOR MACHINING MOISTURE INDICATOR PLUGS

By throwing the start-stop switch to the start position the mechanism becomes entirely automatic.

1. Throw start-stop switch to the start position. This energizes advance solenoid No. 12 on the indexing cylinder through normally open micro-switch No. 1 held closed by dog on retracted drill press feed.
2. Indexing cylinder advances and closes the normally open micro-switches Nos. 2 and 3.
   a. Micro-switch No. 2 energizes advance solenoid No. 5 on one drill press feed and it advances. At fully advance position it closes normally open micro-switch No. 7 which energizes retract solenoid No. 6 and the drill press feed retracts completing one cycle.
   b. Micro-switch No. 3 energizes advance solenoid No. 4 on second drill press feed and it advances. At fully advance position it closes normally open micro-switches Nos. 8, 10 and 11.
1. Closing micro-switch No. 8 energizes advance solenoid No. 13 on ejection cylinder and its piston rod advances. This closes normally open micro-switch No. 16 which energizes retract solenoid No. 14 and the ejection cylinder retracts completing one cycle.
2. Closing micro-switch No. 11 energizes the retract solenoid No. 12 on the indexing-cylinder and its piston rod retracts completing one cycle.
3. Closing micro-switch No. 10 energizes retract solenoid No. 9 on the second drill press feed causing its piston rod to retract.

In its fully retracted position this piston rod closes micro-switch No. 1 and the sequence of operation is repeated.





Photos Courtesy the Bellows Co.

1. COMBINING TWO OPERATIONS in a special machine by use of air operation results in improved hollow milling and counterboring of these plugs.

2. WIRING AND HYDRAULIC CIRCUITS are illustrated in drawing, *left*.

AIR POWER FOR FASTER OPERATIONS

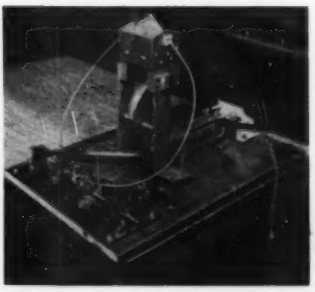
3. A HOPPER TO FEED PINS and an air motor to drive them home two-at-a-time results in a tripling of output on these die cast shell fuses.

"PROTEK" moisture indicator plugs are used to protect aircraft engines in storage and to indicate the presence of damaging quantities of moisture in the cylinders. They replace the spark plugs in the engine, and have a pink substance showing through a transparent window. The pink chemical turns blue in the presence of moisture.

The body of the plug is a zinc die casting. The piece is hollow milled and counterbored before assembly. As separate machining operations, these steps were causing slow production and operator fatigue.

The company designed and built a special machine which combined the two operations, made them automatic and raised production from 800 to 2600 pieces per hour.

The machine has two United States Drill Head Co. heads with a 1:1 driver:spindle ratio.



These heads are advanced and returned by two Bellows air motors. The machine has another air motor to eject completed parts and an automatic indexing work feed table.

Two operators are required to feed parts to the machine. A completely automatic cycle takes the parts through the operations, with the machine indexing automatically at each station. The parts are ejected into a carry-off chute when completed.

AUTOMATIC MACHINE SPEEDS ASSEMBLY

ORDNANCE ITEMS are used in such large quantities that quantity often is more of a problem than quality. The answer to this difficulty can usually be found in a more efficient manner of machine operation.

One manufacturer was producing shell fuses for the Ordnance Department. The design called for two steel pins to be pressed into the fuse body. This operation was carried out on an arbor press. The amount of handling necessary by the operator held production to about 350 pieces per hour.

A new set-up to perform this operation was devised which utilized an air motor built by the Bellows Co. It is shown in Figure 3. A hopper feeds pins through two tubes to a pair of magazines in a jig. The air motor operates two rams through a linkage, and at the same time operates the hopper feed mechanism. The fuse part is held in a jig during the pressing operation.

The air motor is foot controlled, leaving both of the operator's hands free to load and unload the fixtures. The production rate is now 1200 pieces per hour, more than three times the rate with the previous method. In addition, the reduced operator fatigue resulting from the reduction of physical effort has lowered the number of rejects and increased the worker's satisfaction with the job.

New! **BLACK OXIDE PROCESS for STEEL and IRON**

BLACK MAGIC (TYPE A) Pat. Pending

★ **Easily blackens heat treated parts.** BLACK MAGIC Type A overcomes the difficulties normally present in applying a black oxide finish to cyanide hardened pieces, which have been oil quenched, and carbo-nitrided parts.

★ **One bath! One salt!** BLACK MAGIC Type A blackening process requires only 1 bath. The same salt mixture that makes up the initial solution is used to replenish dragout losses, thus maintaining at all times a true, chemically balanced BLACK MAGIC solution. Only 6½ lbs. of BLACK MAGIC salts are required to make up each gallon of solution.

★ **Lower operating temperature.** BLACK MAGIC Type A solution is operated at a boiling point of only 290° F. This substantially decreases the amount of dragout and effects important savings in heat consumption. The higher fluidity of the BLACK MAGIC solution lowers operating costs considerably.

★ **Self rectifying.** BLACK MAGIC Type A overcomes the normal tendency in black oxide processes to build up red iron oxide in colloidal form which eventually clings to the processed work. BLACK MAGIC is so formulated to be self rectifying and under normal and many abnormal conditions will keep the bath in excellent operating condition at all times.

★ **Faster blackening cycle.** Production baths of BLACK MAGIC Type A show a decrease in the blackening time cycles of from 15 to 20%. This is an important factor in speed up in production and lower cost of operation.

Write for Bulletin MB-3 *Send items of your own manufacture for sample processing.*

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QUALITY PRODUCTS OF CHEMICAL RESEARCH

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Prolong the life of your DIES with PANGBORN Hydro-Finish!

PANGBORN Hydro-Finish prolongs life of expensive Tools and Dies by cleaning and polishing to a precision tolerance of .0001". Jobs that formerly took hours are done *in minutes* with *Hydro-Finish!* Fine mesh abrasives are used to clean and improve surface of die casting dies, rubber and glass molds, forging dies, and deep drawing dies, without excessive metal removal.

Dies are clean, rapidly produce hardware finish and give maximum production without expensive hand maintenance! One man alone can operate a Pangborn Hydro-Finish machine.

PANGBORNITE — The best abrasive for all liquid blasting needs. Available in many mesh sizes for precision cleaning.

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Look to Pangborn for the latest developments in Blast Cleaning and Dust Control Equipment.

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BLAST CLEANS CHEAPER with the right equipment for every job

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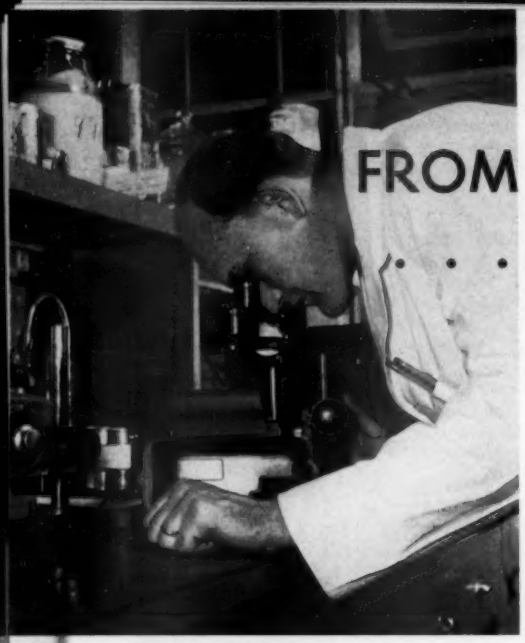
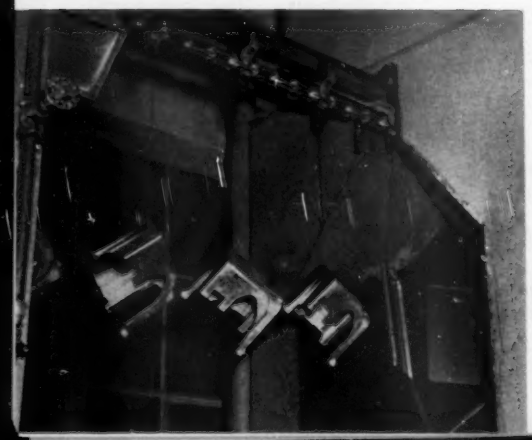
FROM LABORATORY . . . . . TO PRODUCTION



All Paints Are Laboratory Tested.

Electrostatic Spray Gives Even Coating.



QUALITY control is often difficult to maintain in mass production finishing. The Burroughs Adding Machine Co., of Detroit, maintains such control by gearing close inspections and laboratory supervision to the production line.

The company has a conveyorized finishing line that carries parts through a phosphate coating unit, electrostatic paint spray booths and baking ovens. Extreme flexibility is a requirement of this line, since the parts are of different sizes, shapes and materials, and depending upon their functions, receive varying numbers of coats.

The parts, both pressed steel and die cast aluminum and zinc, are used chiefly as covers for mechanisms on the company's business machines. The company performs drilling and tapping operations on the die castings which it makes—machining is done by the supplier on those that it buys.

One of the more important considerations in setting up the line was the selection of a phosphate coating solution that would coat both aluminum and steel satisfactorily. The first solution selected produced heavy deposits of sludge in the tank, causing excessive downtime for cleaning. The solution now used allows operation as long as four months without cleaning the tank.

Parts to be processed are placed on a rack and the rack

LINE

hung on an overhead chain conveyor. This conveyor takes the parts through the automatic phosphate coating system. The cycle consists of a dip in a cleaning solution which is followed by a hot water rinse. The parts are then dipped in the phosphate solution and then given a cold water rinse. A chromic acid dip completes the chemical treatment, after which the parts are sent through a drying oven.

Use Electrostatic Spray

The parts emerge from the oven at a temperature of 310F. Extra conveyor length has been added after the oven to allow the parts to cool before unloading. Total time of the phosphating cycle from loading to unloading is 28 minutes.

The parts are painted in electrostatic spray booths. A red oxide primer is used, and a specially developed gray wrinkle finish applied over the primer. Parts are carried through these booths on separate conveyor systems.

The booths operate automatically, utilizing a high-voltage d.c. electrostatic field to charge the particles of paint and attract them to the work. This method of paint application gives a consistently even coat-

(Continued on Page 58)

Production Increase—300%
Hollow milling and counterboring zinc die cast moisture indicator plugs runs at the rate of 2600 pieces per hour with "Controlled-Air-Power." Old rate was 800.
Foto Facts File FF-47-778
From 40 Parts to 80 Per Hour
Facing the inside of a zinc record changer turntable on a bench lathe was speeded up from 40 to 80 units per hour when "Controlled-Air-Power" went on the job.
Foto Facts File FF-46-402
These Inexpensive Air Powered Units Can Double the Output of Standard Machine Tools
Not only was production increased by half, labor costs per part were cut 66% when "Controlled-Air-Power" was applied to reaming three holes in this zinc die casting.
Foto Facts File FF-46-396
Increased Production 50%

851 2

PRODUCTION of such standard machines as drill presses, tapping machines, milling machines and grinders is frequently more than doubled by the use of inexpensive Bellows "Controlled-Air-Power" Devices.

These small, compact, versatile power feeding and holding units replace manual feeding and clamping . . . make standard hand fed and hand clamped machine tools fast automatic units—actually pay for themselves with the first few days of added production.

Bellows "Controlled-Air-Power" Feeds have a "touch" as sensitive as the most skilled operator, feed work or tools hour after hour with the same uniform, precise feeding action. Bellows Air Vises, or fixtures operated by Bellows Air Motors, hold light or heavy parts in perfect safety, can be synchronized to open and close automatically with the movement of the machine.

If you're looking for ways to increase machine output quickly, investigate the use of Bellows "Controlled-Air-Power" Devices.

Write

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Case histories, photographs, diagrams of Bellows installations which are increasing production from standard machine tools 50% to 500%. No cost, no obligation. Address: Dept. DC-751.

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222 W. Market St.
Akron, Ohio

The Bellows Co.
ESTABLISHED 1911
AKRON 9, OHIO

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ORGANIC COATINGS FOR SUBSTITUTE FINISHES AND PROTECTIVE FILMS*

By B. F. AMES
Maas & Waldstein Co.

". . . The M7 order regarding aluminum, when first promulgated was considered adequate, however, shortly after its issuance defects were found in the structure of this directive, which prompted certain changes. Shortly after these defects were corrected changes in this initial regulation were experienced for the third time within a period of two weeks. You can readily appreciate the confusion that existed in our industry since the metals regulations seriously effected the availability of many organic coatings.

"Unfortunately one of the few directives that has remained intact from its inception is the metals regulation regarding the use of brass, bronze, copper, nickel, and in some cases, chromium. Recognizing the seriousness of these restrictions we endeavored to offer industry suitable substitutes for those metals that were used both in plating and in fabrication.

"As far back as September, 1950, we were approached by many industries in which plating and fabrication were done with brass, copper, bronze, nickel, chromium and so forth to learn if it were possible to use organic coatings instead of plating.

"At the present time zinc base die castings plated with copper, nickel and chromium are still being used for automotive trim for hardware, for builders' hardware, bathroom fixtures and many other products, but it is expected in the near future that plating will be discontinued. It is thought that this plating process will be replaced with copper chrome plating after the supply of nickel is used up and suitable clear coatings will be used to protect the chromium.

"Subsequently, plating practice may resolve itself to chrome plating directly on zinc and possibly zinc plating directly on zinc die castings. As a last possibility, when zinc plating becomes unavailable, manufacturers desiring to use zinc die castings will then polish these parts. In any of these instances clear baked synthetic coatings or clear air drying lacquers should be used to serve as a protective coating.

"Other companies are applying a flash of bright zinc to the zinc die castings and then a dip into a passivating solution. This procedure brightens and passi-

(Continued on Page 61)

*Excerpts from a paper delivered before several branches of the American Electroplaters Society.

ZINC ALLOY CAMERA CASES are ground satin-smooth with 3M Abrasives at Clarus Camera Co., Minneapolis, Minn.

How the right abrasive boosted belt life 600%

Loading caused by soft metals was limiting production to 40 units per belt at Clarus Camera Co. until the 3M representative recommended the *right* abrasive for the job. Now production has jumped to 240 units per belt!

Are *you* getting maximum production from *your* present abrasives? A 3M representative will be glad to show you how to cut your finishing time, get a smoother surface at a lower cost.

As an additional service, free analysis of your grinding problem is offered at any one of our 13 demonstration rooms—each located in a major industrial area. A 3M Methods Engineer will be glad to help you. Use coupon below.

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St. Paul 6, Minn.
☐ Please have a 3M Methods Engineer call.
☐ Please send copy of new "Step Up Production" booklet explaining the 3M Method of Grinding and Finishing.
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3M ABRASIVE BELTS

Made in U.S.A. by MINNESOTA MINING & MFG. CO., St. Paul 6, Minn., also makers of "Scotch" Brand Pressure-sensitive Tapes, "Scotch" Sound Recording Tape, "Underseal" Rubberized Coating, "Scotchlite" Reflective Sheeting, "Safety-Walk" Non-Slip Surfacing, "3M" Adhesives. General Export: Durex Abrasives Corp., New Rochelle, N. Y. In Canada: Canadian Durex Abrasives Ltd., Brantford, Ontario.

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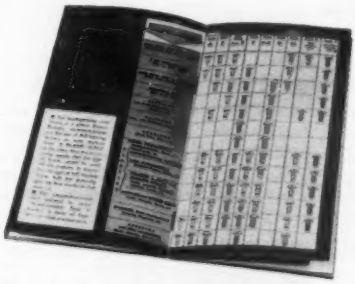
Here are the essentials of P-K Self-tapping Screw selection and use, condensed into a 24-page, pocket-size reference booklet. This new edition is redesigned and improved to give you all the information you need, and help you find it faster.

It's ready just in time to help you with your current task of training a large number of new assembly workers. And for veterans, too, it will help avoid mistakes that cause spoilage and slow up production.

Get the copies you need from your P-K Distributor—ask for Form No. 480. Or write Parker-Kalon Corp., 200 Varick St., New York 14.



Tells WHERE to use WHAT P-K Self-tapping Screw in Metals or Plastic

Gives Hole Sizes and Application Data for all types of P-K Screws

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The Original
PARKER-KALON® SELF-TAPPING SCREWS

A TYPE AND SIZE FOR EVERY METAL AND PLASTIC ASSEMBLY

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NEW PRODUCTS

For additional information on the products appearing on this and the following pages, mark the key number of the item on the card bound into this issue. Drop the card in the mail—no postage is required.

NICKEL BRIGHTENING PROCESS

Smoothex Nickel Brightener Process
Gill Corp., Cleveland, Ohio

SPECIAL FEATURES: Three addition agents are added to the standard Watts formula. Company specifications call for high current densities to give fast plating. Good line-filling properties are claimed for this process.

SPECIFICATIONS: The addition agents are organic in nature. They are: Smoothex No. 400, a primary brightener in powder form, Smoothex No. 50, a secondary brightener in liquid form, and Soothex No. 200, a wetting agent in paste form designed to control pitting. Process is operated with current densities from 5 to 100 amperes per square foot.

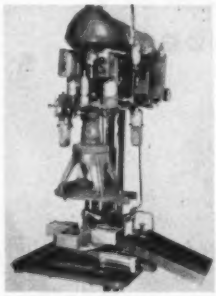
For additional information circle No. 92 on the Reader Service Card.

Circle No. 4 on Reader Service Card.

TAPPING AND DRILLING MACHINES

Beckett Air-Operated Tapping and Drilling Machine
Beckett-Harcum Co., Wilmington, Ohio

SPECIAL FEATURES: These machines are designed to customer specification and can be fitted with automatic, air-controlled multiple spindle heads and index tables. This machine will tap Class 2 and 3 fits in soft metals such as magnesium. Tapping and drilling can be done from the same fixtures by removing the drill fixtures. The machine shown was designed for use on die cast parts.



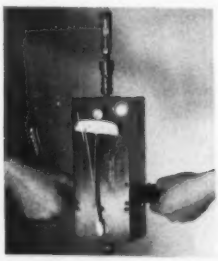
SPECIFICATIONS: Light air pressure allows taps to provide own lead. Multiple tapping is accomplished with a high-reversal motor which reverses the taps when they have reached the desired depth. Motor reversing control is switched out for drilling. Forward and return spindle speed are infinitely variable. Hydraulic break-through cushion for drilling uneven surfaces. 100 psi air line gives drilling pressure up to 1250 psi. Index table electrically interlocked with spindle stroke. Taps and drills automatically lubricated. Light work can be ejected from fixture by air.

For additional information circle No. 93 on the Reader Service Card.

TORQUE-INDICATING POWER DRIVER

Garvin Torque Indicating Driver
Tru-Circle Products Co., South Bend, Indiana

SPECIAL FEATURES: This tool can be used to drive studs, nuts, screws, etc., and set them with a pre-determined torque. It can be air or electrically operated. The smallest model is portable, others are mounted on drill press type arms.



SPECIFICATIONS: The driver is built around a standard deflection-type torque wrench. In operation minimum torque is indicated on the scale and by a green light. Maximum torque is indicated on the scale and by a red light. Unit can be furnished with a relay that stops rotation when the desired torque is reached. Maximum and minumum torque limits are set with two screws using wrench as a gage. Wrench may be removed for calibration. Driver is made in 100, 350, 500, 750, 1500 and 2000 inch-pound maximum torque capacities.

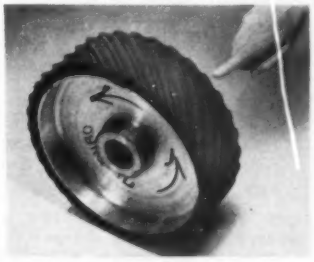
For additional information circle No. 94 on the Reader Service Card.

CONTACT WHEEL INCREASES BELT LIFE

"61" Contact Wheel

Carborundum Co., Niagara Falls, N. Y.

SPECIAL FEATURES: Advantages claimed for this contact wheel in backstand abrasive belt work are: longer belt life, less operator fatigue, better finish and less down-time. Initial tests conducted



by the company on low-carbon steel gave an increase of 2 to 4½ times in amount of metal removed during the life of the belt.

SPECIFICATIONS: This is a specially-serrated rubber contact wheel. The relief angle, and the wide-spaced narrow lands are based on the design of milling cutters. Although at present the applications of this wheel are for replacement of other wheels in operations where belts are discarded because of glazing, preliminary company tests indicate a similar improvement with resin-bonded belts in rough work.

For additional information circle No. 95 on the Reader Service Card.

PREVENT SHOCK IN MACHINE HYDRAULIC SYSTEMS

Surge Damping Valve

Denison Engineering Co., Columbus, Ohio

SPECIAL FEATURES: These units are adaptable to any hydraulic

circuit and are available in a variety of sizes for various applications. They are said to eliminate shock in die casting machine and other high pressure hydraulic systems. Small and easily installed, they will not slow down cycle time, according to the manufacturer.

SPECIFICATIONS: These units prevent, rather than absorb hydraulic shock. Valve adjusts itself to any working pressure automatically. A normally closed valve, it opens gradually as pressure

DUMORE DRILL HEAD GIVES 97% Cost Reduction on Tough Job

"Saving on first 4½ hours production on this one operation, repaid the cost of the drill head," says Harold Forsmark, Chief Engineer of Stiger Precision Products, Inc., Cicero, Ill.

OLD WAY—$.385 per piece

Problem was to drill 2 tie-wire holes at an angle thru 1" x 1" x ½" stainless steel nut of 15-20 Rockwell hardness with a No. 50 drill. Maximum production with hand-fed press was 10 pieces an hour and operator broke from 14-18 drills per day at 20c per drill.

DUMORE WAY—$.0117 per piece

With the Dumore Drill Head, Stiger gets 120 pieces an hour and has eliminated drill breakage and scrap loss.

If you're using No. 80 to ⅛" drills, it will pay you to get the facts on the New Dumore Drill Head.

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DDH-5D

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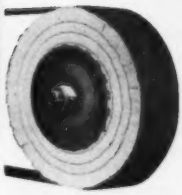
ZIPPO BUFFS

These famous long-wearing buffs run cool under all buffing conditions. Constructed of high count bias-cut cloth mounted on safe steel centers. Available in a wide range of densities and center diameters.



for

STYLE C-20 CONTACT WHEELS and F-26 Belt Lubricant

A C-20 flexible Contact Wheel will form itself to the shape of the work and permit the abrasive belt to polish contoured surfaces and F-26 Abrasive Belt Lubricant will increase belt life by preventing loading and glazing. Produces finer, smoother and brighter surfaces through lubrication.

for

BUFFING COMPOUNDS

A complete line of production buffing compounds. Produced in bar and tube form. Formax is the originator of the "Spraymax" Liquid Compounds for brush or spray application.

for

FLEX-A-GLU POLISHING WHEEL CEMENT

—A flexible synthetic adhesive in a ready-to-use form. Dries quickly. Increases polishing wheel life and produces uniform finishes regardless of grit size used.

Send for Descriptive Literature

FORMAX MANUFACTURING CORP
3171 Bellevue Ave. DETROIT 7, MICH.

MANUFACTURED IN CANADA BY JOHN GALLOWAY LTD., KITCHENER, ONT.

Circle No. 9 on Reader Service Card.

is applied to the inlet side. Its rate of opening is controlled by the differential between inlet and outlet pressures. Rate of flow increases as outlet pressure approaches inlet pressure.

For additional information circle No. 96 on Reader Service Card.

ENGRAVING MACHINE HAS SIGHT FEATURE

Model UE-3 Engraver

H. P. Preis Engraving Machine Co., Hillside, N. J.

SPECIAL FEATURES: This engraver is designed to engrave raised or intaglio designs, particularly lettering, in unhardened tool steel dies and other materials. Special cut-away design of pantograph arms permits full view of both pattern and work.

SPECIFICATIONS: Pantograph ratios from 1.7:1 to 7:1 are adjusted on cylindrical sliding members with precision markings. Positive lock is provided for these members. Adjustable copy table holds metal or plastic (raised or intaglio) letter masters. Forming guide may be used to engrave curved surfaces. Ball bearing mounted spindle has cam-actuated drop lever for raising or lowering the engraving cutter. Cutter has drop of 5/32" and is graduated in .001 finger screw adjustments.

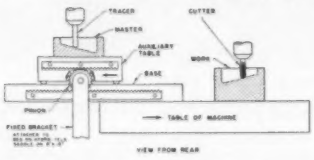
For additional information circle No. 97 on the Reader Sevice Card.

MACHINE MAKES MATCHING DIE HALVES

Reverse Image Attachment

The Cincinnati Milling Machine Co., Cincinnati, Ohio

SPECIAL FEATURE: This attachment is designed for use with certain Hydro-Tel Type milling machines made by the company. It uses one half of a pair of dies as a pattern to cut the other half



in reverse image. It is therefore necessary to have only one pattern to mill both dies.

SPECIFICATIONS: These attachments are available for three of the company's milling machines; the 8" by 18" tool and die miller, the 16" vertical Hydro-Tel and the 28" vertical Hydro-Tel. The maximum length of cut is from eight to 26 inches depending upon the size of the milling machine.

For additional information circle No. 98 on the Reader Service Card.

SPRING-OPERATED TAPPING MACHINE

No. 72 A Tapping Machine

Ettco Tool Co., Brooklyn, N. Y.

SPECIAL FEATURES: A tapping machine designed for work on small parts. Feed is started by foot pedal or air cylinder, leaving

(Continued on Page 60)

ACROMARK
MEANS ACCURATE MARKING

ENAMEL FILL YOUR DIE-CAST PARTS with

THE ACROPRINTER
Reg. U. S. Pat. Off.

Write For Latest Literature

Hand and Motor Driven Models

The ACROMARK Company

426 Morrell St., Elizabeth 4, N. J.
"The Original Marking Specialists"

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W. F. LUCAS JOINS DETREX

William F. Lucas has been appointed as assistant to E. H. Ehlert, Western region manager of Detrex Corp., Detroit, Michigan. Mr. Lucas will make his headquarters in the Chicago office, 600 South Michigan Ave., will supervise the technical applications and the field servicing of phosphate-type of rust-proofing compounds, and alkaline and emulsion cleaners, in Wisconsin and northern Illinois.

MATTSON JOINS PENNSALT

Kirk C. Mattson has joined Pennsylvania Salt Mfg. Co. of Washington as district sales manager of the company's Los Angeles office. Mr. Mattson will supervise sales and service of the Industrial Chemicals and Agricultural Chemicals Departments in Southern California, Arizona, Nevada and New Mexico. Pennsalt's Southern California office is located in the Westland Warehouse Building, 4820 Loma Vista Avenue, Los Angeles.

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This 22-page booklet is guaranteed to open your eyes! It gives you the inside story of advanced barrel finishing as never told before!

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22 PAGES OF FACTS

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ALBERT LEA, MINNESOTA
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FOR TOOL ROOM AND PRODUCTION

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VERSATILITY. For cylindrical, internal, external and form grinding; for milling with H.S. steel or tungsten carbide midget mills; for micro-finishing and polishing. Use on wood, glass, rubber, plastics, or any metal including the hardest alloy steel.

DURABILITY. All metal housing, rigid PRECISE quill, lubricant-sealed, micro-precision bearings 1/4 H. P. AC-DC motor (115 volts) is protected by replaceable fusetrons.

ATTACHABLE COOLFLEX SHAFT (optional). Quickly attached for bench work and handtool applications. Same speeds, same precision quill as in PRECISE GRINDER-MILLERS.

Write FOR CATALOG

PRECISE PRODUCTS CO., 1342 Clark St., Racine, Wis.

PRECISE GRINDER-MILLERS

Circle No. 8 on Reader Service Card.

Oakite's New FREE Booklet on Paint Stripping

WHAT'S THE BEST WAY TO STRIP PAINT FROM METAL PARTS TOO LARGE TO BE SOAKED IN TANKS?
See Page 3

answers many questions that will lead you to better stripping procedures. You'll want to read more about:

What's the best way to strip large areas of structural metal where a steam supply is available? *See page 5.*

What's best when steam is not available? *See page 7.*

What is the cheapest way to strip metal parts in large volume? *See page 9.*

What are the best ways to prepare stripped surfaces for re-painting? *See page 11.*

What strippers are best for removing oil-base paints? . . . Synthetic enamels, alkali-resistant plastics or resin-based paints? . . . Japans, wrinkle finishes, nitrocellulose lacquers, alkyds, phenolics and ureas? *See page 12.*

FREE For a copy of "How to STRIP PAINT" write Oakite Products, Inc., 34G Thames Street, New York 6, N. Y.

Technical Service Representatives in Principal Cities of U. S. & Canada

OAKITE SPECIALIZED INDUSTRIAL CLEANING MATERIALS • METHODS • SERVICE

Circle No. 13 on Reader Service Card.

FORMAX PROMOTES GAINES

The Formax Manufacturing Corp., Detroit, manufacturers of polishing and buffing wheels and compounds, has appointed Don A. Gaines New England regional manager, according to Edward McAleer, vice-president of the company.

YOUNG APPOINTED BY WAGNER

Wagner Brothers, Inc., Detroit, manufacturers of polishing, buffing and plating equipment and supplies, has announced the appointment of William Young as district sales manager for Cincinnati and southern Ohio. Mr. Young was formerly with the Udylite Corp.

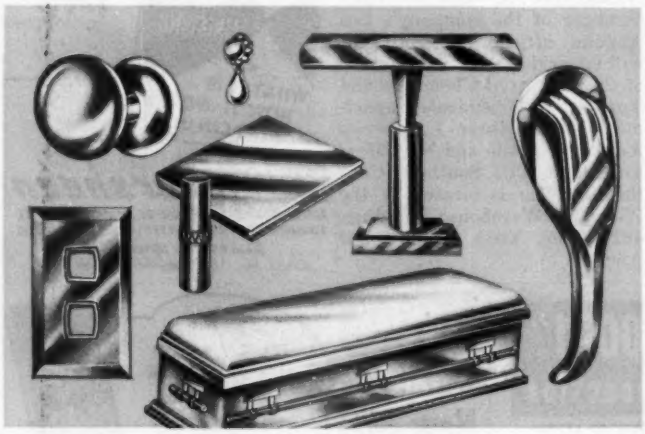
L. F. R. BELLOWS DIES; WAS HEAD OF PNEUMATIC DEVICE CO.

L. F. R. Bellows, president of The Bellows Co., manufacturers of pneumatic equipment, and The Bellows Electric Sign Corporation, both of Akron, Ohio, died May 28 at Detroit, Michigan. Mr. Bellows was 69.

L. F. R. Bellows founded Bellows & Company to manufacture electric signs, in Detroit in 1911. His company, in 1925, was the first to introduce and develop Neon signs in the middle west.

Early in 1940 Mr. Bellows became interested in pneumatics, and with Herbert B. Link of Akron, organized The Bellows Company, to manufacture and distribute pneumatic devices. The company now has plants in Akron, Ohio, Warsaw, Ind., Detroit, Mich. and Los Angeles, Calif.

Mr. Bellows was an ardent yachtsman. He had been active in the Detroit Yacht Club for many years, serving as Commodore of the club in 1933.



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PACIFIC COAST DIV. - SMITH-DAVIS CO., 10751 VENICE BLVD., LOS ANGELES 34, CAL.

MANUFACTURERS OF INDUSTRIAL FINISHES

Circle No. 26 on Reader Service Card for more information.

APPOINT CHICAGO REP.

Frederic B. Stevens, Inc., of Detroit have announced the appointment of James J. Cooper to their sales organization.

Mr. Cooper will serve as sales consultant representing the Stevens line of buffing compositions, plating equipment, and plater's supplies in the Chicago area.

For the past five years he has been a sales representative for a distributor of chemicals and minerals for the metal finishing industry.

CASE PROMOTED BY AMERICAN CYANAMID

Edward N. Case has been appointed product supervisor for metal trades product sales in the synthetic organic chemicals department of the Industrial Chemicals Div., American Cyanamid Co. Mr. Case will have his headquarters at the company's New York office.

USEFUL LITERATURE

For additional information on the products appearing on this and the following pages, mark the key number of the item on the card bound into this issue. Drop card in the mail—no postage is required.

170 PNEUMATIC HOLDING GRIP:

A pneumatically-operated holding grip to hold castings during cleaning operations is described in Bulletin 76-M, offered by the Joy Mfg. Co. The grip is designed to hold castings of from 2 to 20 inches, regardless of individual shape.

171 VAPOR DEGREASING METAL PARTS:

A question and answer booklet about vapor degreasing is available from the Phillips Mfg. Co. The 21-page handbook answers questions most often asked about vapor degreasing, tells what it is, what equipment is needed and to what materials it may be applied.

172 BRIGHT FINISHING DIE CASTINGS:

Substitute finishing of die castings is covered in literature obtainable from United Chromium, Inc. Two processes described are zinc or chrome plate directly on the die casting, covered with a clear dip and/or a baking synthetic.

173 RETAINING RINGS:

Four bulletins on retaining rings used for positioning parts on shafts and for forming shoulders are offered by Waldes Kohinoor, Inc. Complete specifications and examples of applications are included in the text.

174 TOOL BITS FOR HIGH SPEED, HEAVY DUTY:

Tool bit materials for commercial turning work, heavy duty work or for turning soft or abrasive work at high speeds are described in Folder No. A-21, available from the Gorham Tool Co.

175 CLEANING SURFACES FOR BLACK COATING:

Data on materials and methods for obtaining the chemically clean surface required for black oxide finishing of metals is presented in a special service report published by Oakite Products, Inc.

176 LIQUID AND SOLID ADHESIVES:

Adhesives for bonding metal to metal or to other materials are described in literature obtainable from Houghton Laboratories, Inc. These abrasives are supplied in either liquid or solid form.

177 SOLUBILIZING CLEANERS:

A line of detergent compositions which will remove both water-soluble and water-insoluble soils is described in a bulletin published by the Pennsylvania Salt Mfg. Co. These cleaners are said to be especially effective in removing buffing compounds.

178 ALCOA RESEARCH LABORATORY:

Descriptions of the plant and its equipment, as well as explanations of the aim and scope of the research, are contained in a 14-page booklet about Aluminum Company of America's East St. Louis Laboratories.

179 PRECISION MILLING, BORING AND GRINDING:

Production, maintenance and experimental shop machining can be accomplished with the Versa-Mil, a tool made by the Versa-Mil Co. The company's Bulletin No. 8 describes the tool, which is used with other machine tools or with work holding fixtures for milling, grinding or boring operations.

180 HYDRAULIC OIL PURIFYING:

Details on oil purifying equipment manufactured by the Honan-Crane Corp. are contained in bulletins offered by the company. An oil purifier for use on die casting machines is described in one, and a magnetic filter for cleaning liquid machining coolants in another.

181 FASTENERS FOR AIRCAFT:

A catalog of fasteners manufactured for military and civilian aircraft by Tinnerman Products, Inc. is available from the company. The catalog lists the fasteners manufactured under Mil-N 3337 specifications, which covers requirements for all government applications.

182 INSPECTION EQUIPMENT:

Equipment for inspections from simple naked-eye illuminated inspection to high-power, close tolerance microscopic examinations is covered in a bulletin offered by Arthur S. LaPine & Co. Black light, fluorescent and around-the-corner inspection equipment is also described.

183 AUTOMATIC FINISHING EQUIPMENT:

Automatic polishing, grinding and buffing equipment manufactured by the Murray-Way Corp., is illustrated and described in literature offered by the company.

184 HOW TO USE GAGE BLOCKS:

Information on the manufacture of gage blocks, their use and maintenance is available from the Webber Gage Co.

185 LUBRICATING DIE CASTING DIES:

"Colloidal Graphite Lubricates Die Casting Machines" is the title of a technical article offered by Acheson Colloids Corp. It tells how colloidal graphite can be used both as a die lubricant and to lubricate moving parts such as cores.

186 MACHINE TOOLS:

Machine tools for milling, broaching, grinding, lapping and flame hardening are described and illustrated in Catalog No. M-1712, available from the Cincinnati Milling Machine Co.

GUPTIL APPOINTED ECLIPSE REPRESENTATIVE IN MINNESOTA

Eclipse Fuel Engineering Company, Rockford, Illinois, makers of gas-fired industrial heating equipment, announces the appointment of Charles W. Guptil, as Eclipse representative, replacing Henry E. Balsley, 1694 Grand Ave., St. Paul 5, Minnesota, who retired as of July 1.

Mr. Guptil is a graduate of the University of Minnesota and in addition to four years service in the U. S. Navy, has been associated with Minneapolis Gas Company, Western Oil and Fuel Company in charge of LPC department, Cleveland Branch Office of Bryant Heater Division, Affiliated Gas Equipment, Inc., and also more recently manager of their St. Louis Branch. He has been associated with Mr. Balsley in the St. Paul, Eclipse office since July 1, 1949.

WORM AND HELICAL GEARS

(Continued from Page 19)

three are die cast in zinc alloy. The complete mechanism is illustrated in Figure 2.

The adjusting shaft represents a typical mechanical component which comes from the die virtually ready for use, but which could not be fabricated otherwise without extensive machining. The die parting has been arranged along the length of the part so that it bisects the worm gear. Thus, the worm is formed without undercuts, special coring or other special tooling involving extra costs. Moving cores from each end form a square recess to receive the crank, and four detents at the other end to provide positive quarter-turn stops.

If machined from bar or special forged shape, this piece would be extremely wasteful of metal and labor. The die casting is not machined and therefore results in no waste of metal and consumes no labor in secondary processing.

Helix Calls For Special Die Construction

Another special component is the spring retainer with integral helical gear. While the slight helix of the gear teeth requires some special die construction because of the undercut, die casting is still the least expensive method of producing this part.

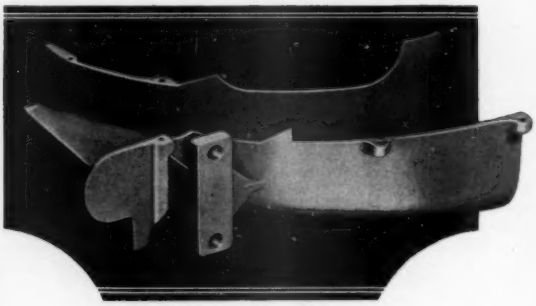
The die parting lies along the face of the gear, so that a light facing operation removes the flash. To attempt to remove flash of this type with a trim die would be difficult if not impossible. The only other operation is the drilling of a small cross hole for set screw to hold the spring end into the cored hole.

Some attempt has been made to get the spring retainer for the opposite end of the spring fabricated from powdered metal, but the thin walls, double cylinder shape and extra lug for the spring retaining hole make it too difficult to press.

The die castings are functioning parts, but do not come into operation more than occasionally. Strength and service life of these parts are far in excess of the requirements.

Thus, hidden from view, but

"Cleveland"



TOP "BOBBIN CHUTE"
Another Example Precision

And now to meet your requirements for
DEFENSE DIE CASTINGS

QUOTATIONS ON BLUEPRINTS Z WILL BE PROMPT

DIE CASTING DIVISION
The Cleveland Hardware & Forging Co.
Established 1851
3256 E. 79 ST. CLEVELAND 4, OHIO

doing an important job as the "heart" of this special device, three small die castings are proving to be a production aid in the manufacture of thousands of Pedtype units.

PORTABLE TOOL

(Continued from Page 28)

attached to the base plate in Figure 4. These parts allow for vertical and angular adjustment of the saw, and hold the body of the saw to the base plate.

The hinge and the scale bracket are located on the base plate by means of cast lugs which fit recesses in the plate. They are held to the base plate with rivets. The elevating bracket swings on hinges cast integrally with the parts.

The scale bracket is an example of the savings that can be realized merely by engraving the die. A 55-degree protractor is cast integrally with the bracket. All that is necessary to obtain an accurate scale on the bracket is to engrave the die accurately at the beginning. The scale will then be provided on each bracket with no machining or assembly costs.

The elevating bracket is heavily ribbed for reinforcement. A large boss is cored out on this part to receive the elevating shaft, a steel part which is machined from bar stock. The shaft is pressed into the elevating bracket and held in place with a set screw.

At the other end of the bracket is a small, integrally-cast post. A metal-saving core forms an opening inside this post, and the post is well reinforced at the base to prevent distortion. This post serves as a guide to align the saw with the base plate. A small zinc die cast locking handle holds the elevating bracket in the desired position on the scale bracket.

The other die castings used in the saw are shown in Figures 5 and 6. All of these are exterior parts, and the die caster has helped lower machining costs considerably by keeping parting lines off the exposed surfaces wherever possible.

A considerable saving over the former sand cast method was made in the case of the lower saw guard. A slot for the guard spring is cored in the die casting, whereas in a sand cast part it was necessary to machine this slot out.

All exterior parts are given a matte finish by polishing on a set-up wheel and wire brushing. Flash is first removed with an emery wheel or an abrasive belt. A rough finishing operation with a wheel or belt is followed by vapor degreasing. The final finishing operation utilizes a stainless steel wire brush to give the matte effect.

The extensive use of aluminum die castings in the saw has given this product sturdy construction with a weight of only 19½ pounds. In addition, machining costs have been lowered considerably, and a lasting, attractive finish has been obtained at low cost.

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MECHANISM FRAME for precision instrument. Aluminum alloy die casting, weight 7 ozs. Complex shape with inside projections were obtained by intricate coring.

10-inch balanced BLOWER FAN with V-Pulley. One-piece zinc alloy die casting.

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FEDERAL built dies and high pressure casting equipment with water hydraulic injection assure die castings of

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PHONE ARMITAGE 6-4803

SMALL AIR CYLINDER

(Continued from Page 31)

in the die cast heads, as are the eight end mounting holes, two side mounting holes, air inlet hole, and piston rod hole.

Power developed is approximately equal to the applied air pressure, and although little stress is applied to the die cast heads, they have proved to be sound, non-porous and capable of withstanding normal handling and abuse.

The midget-sized air cylinder is neat in appearance, with the company name formed in the rear head for product identification. The castings are given a black anodized finish which is uniform and smooth. This gives a color scheme of black and brass yellow which is utilized throughout the entire family of Bellows' products, accented with an oval-shaped red, white and black decal trademark.

The entire cylinder from front face to rear face, measures only 3 3/64 inches and the outside dimensions of the flanges are 1½x1½ inches. The cylinder has a 1⅛ inch bore and 1 inch stroke.

Sale of these small, versatile units is expected to be very wide, and thus a definite saving in shipping costs will result from the use of aluminum alloy for the die castings.

From the die casters' viewpoint, these two small components offered no unusual problems. They are produced in a two-cavity die which helps in maintaining inventory of parts, and while a high quality surface finish and sound internal structure are required, the relatively simple shape of the castings makes this possible.

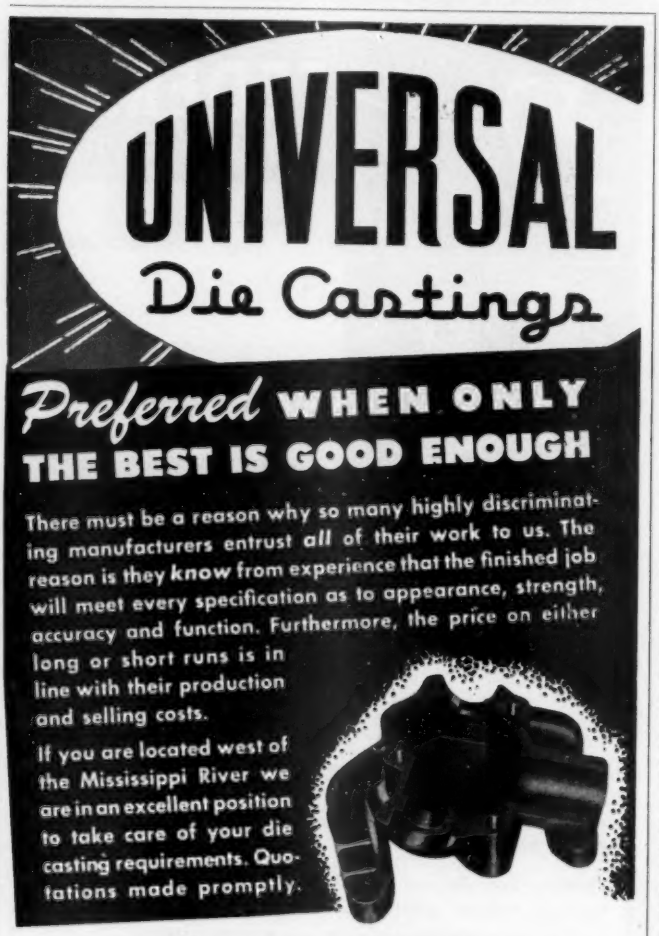
RESEARCH FOUNDATION PROMOTES METALLURGIST

Dr. Max Hansen, 50, German metallurgist, has been named assistant chairman of the metals department of Armour Research Foundation of Illinois Institute of Technology. Dr. Carl E. Swartz, chairman of the metals department, announced the appointment.

Dr. Hansen will continue his work in physical metallurgy in which he has established an international reputation. He joined the Foundation in June, 1949, and has been supervisor of projects dealing with non-ferrous metals. He is active in the American Institute of Mining and Metallurgical Engineers and the American Society for Metals. He was an associate professor of metallurgical engineering at Illinois Institute of Technology for two years.

Hansen came to the United States from Germany in 1947 after completing a compilation of German scientific progress during World War II for the technical field information agency in the United States Military Government office.

From 1937 through 1945, he was director of research for Durener Metallwerke, Duren, Germany. He is the author of a book on the constitution of binary alloys.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Die Castings
Preferred WHEN ONLY
THE BEST IS GOOD ENOUGH
There must be a reason why so many highly discriminating manufacturers entrust all of their work to us. The reason is they know from experience that the finished job will meet every specification as to appearance, strength, accuracy and function. Furthermore, the price on either long or short runs is in line with their production and selling costs.
If you are located west of the Mississippi River we are in an excellent position to take care of your die casting requirements. Quotations made promptly.
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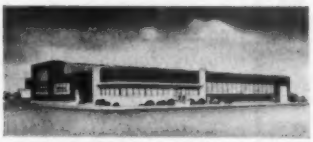
INDUSTRY NEWS

NEW DIE CASTING COMPANY COMPLETES PLANT

The recently organized Admiral Die Casting Corp. has announced the completion of its new plant at 200 West 83rd Street, Chicago. The



plant includes machines for die casting zinc, aluminum and magnesium alloys. Machining, cleaning, painting and engineering departments are also included in the facilities.

Henry Kleifgen is president of the new company. He was formerly associated with the Central Die Casting & Mfg. Co., Chicago, as production manager.

ST. JOSEPH LEAD APPOINTS TWO

The St. Joseph Lead Co. has announced the election of Rene J. Mechin and Charles R. Ince as vice-presidents of the company.

Mr. Ince attended Columbia University where he did research and taught until 1929, when he joined St. Joseph Lead Co. as assistant sales manager. He held this position until 1948, when he was made metal sales manager.

Mr. Mechin graduated from the Colorado School of Mines in 1919 and worked in Mexico until 1925. In that year he joined St. Joseph Lead Co.'s engineering department in Southeast Missouri. In 1926 he was made division manager of the company's Balmat-Edwards properties, and in 1949 he was moved to the New York offices of the company.

PROCUREMENT INFORMATION CENTERS

Under Secretary of the Army Archibald S. Alexander has announced plans for the establishment of sample display and procurement information centers in various cities as an aid to business firms wishing to become Army suppliers.

At the new centers, potential suppliers will be able to examine products or component parts of items which the Army procures. In most cases the centers will also have on hand plans, specifications and drawings to show what is needed from both prime contractors and sub-contractors. Business men will have an opportunity to have their firms listed for items that they are equipped to produce. Suppliers are selected from such lists for both advertised and negotiated procurements.

The new centers will be segregated as to type of procurement, such as Chemical, Ordnance, Signal and Transportation. Listed below are the information centers in the Ordnance category:

Birmingham Ordnance District
1706 Second Ave., North, Birmingham, Ala.

Boston Ordnance District
Boston Army Base, Boston, Mass.

Chicago Ordnance District
209 West Jackson Blvd., Chicago, Ill.

Philadelphia Ordnance District
1500 Chestnut St., Philadelphia, Pa.

Pittsburgh Ordnance Office
Room 311, Old Post Office Bldg., 4th Ave. and Smithfield, Pittsburgh, Pa.

Rochester Ordnance District
1260 Sibley Tower Bldg., Rochester, N. Y.

St. Louis Ordnance District
4800 Goodfellow Blvd., St. Louis, Mo.

Oakland
Commanding Officer, Oakland Army Base, Oakland, Calif.

Joliet
Commanding General, Ordnance Ammunition Center, Joliet Arsenal, Joliet, Ill.

Watertown
Commanding Officer, Watertown Arsenal, Watertown, Mass.

Metuchen
Commanding Officer, Raritan Arsenal, Metuchen, N. J.

Copies of "Index of Military Purchasing Offices," a guide to industry in selling to the military departments, are available from the Central Military Procurement Office, Munitions Board, Department of Defense, The Pentagon, Washington 25, D. C.

BRITISH DIE CASTERS TOUR U. S.

Under the auspices of the Anglo-American Council on Productivity and the Economic Cooperation Administration, a group of 17 British executive and production workers in the zinc and aluminum die casting industry are making an extensive tour and study of American die casting plants and methods.

Shop Foremen Say:

"When You Need

ZAMAK ZINC BASE

DIE CASTING ALLOYS

HENNING

CAN'T BE BEAT!"

Ask any man who has worked with our product and he'll give you a dozen reasons in five minutes why he wouldn't use any other. Try it and be convinced.

Phone
HYacinth 7-3470

HENNING BROS. & SMITH INC.
95 SCOTT AVE., BROOKLYN 6, NEW YORK

HB&S HB&S HB&S HB&S

The tour opened May 18 with a visit to the plant of the Ajax Engineering Corp. in Trenton, N. J., manufacturers of low frequency electric induction furnaces. After a trip through the Ajax plant, the group was taken to the Trenton plant of the Ternstedt Div., General Motors Corp., to see one of the furnaces in operation.

The objective of the team is to study administration, layout, plant methods and operating conditions in the American zinc and aluminum die casting industry, together with a study of the applications made in this country of die cast products.

The plant visits are arranged on a management and labor cooperative basis. In this way the British obtain an impression of the intangible factors as well as the technical developments which increase production in the United States.

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Admiral ADC

DIE CASTING CORPORATION

202 West 83rd Street Chicago 20, Illinois

SIMMONS ELECTED DIRECTOR

Clifford H. Simmons, president of the Universal Die Casting & Mfg. Corp., Saline, Mich., has been elected a director of the Crescent Butte Mining & Milling Corp., Gunnison, Colo.

Mr. Simmons is also president of Universal's wholly - owned subsidiary, Utilex Manufacturing Corp. Universal produces component die cast parts for the automotive and refrigeration industries, and Utilex manufactures die cast plumbing hardware and commercial castings.

FURNACE COMPANY MOVES

Bellevue Industrial Furnace Co., Detroit, manufacturers of heat-treating and melting furnaces, has announced the removal of its general offices, engineering department and manufacturing facilities to a new location in Detroit at 2620 Crane Ave.

The company plans to enlarge the facilities already existing at the new location and to be in full operation there this summer.

NEW COATING FOR MAGNESIUM DEVELOPED BY ARMY

A new electrolytically-applied coating called HAE has been developed for magnesium in the Pitman Dunn Laboratory at Frankford Arsenal. The coating, which was named for its discoverer, H. A. Evangilides, was developed as an Army Ordnance Corps project.

It is said to be resistant to corrosion, abrasion and galvanic action, have g o o d dielectric strength and a high melting point and to be hard enough to scratch glass or polish Rc65 steel. The coating can be applied as thin as .0015 inches and is said to provide an excellent paint base. With a wax coating, HAE-coated test panels have withstood 4,500 hours of salt spray with no corrosion. It has greater resistance to heat than the base metal.

ZINC INSTITUTE ELECTS DIRECTORS

At the recent annual meeting of the American Zinc Institute, the following directors were elected for the term ending in 1954: J. M. Bowlby, Eagle-Picher Co.; R. B. Caples, Anaconda Copper Mining Co.; E. V. Daveler, American Zinc, Lead & Smelting Co.; S. A. Easton, Bunker Hill & Sullivan Mining & Concentrating Co.; Clarence Glass, Anaconda Sales Co., and R. L. McCann, New Jersey Zinc Co.

Other directors elected for this term were G. W. Potter; A. L. Queneau, U. S. Steel Corp.; F. A. Wardlaw, Jr., International Smelting & Refining Co., and H. I. Young, American Zinc, Lead & Smelting Co. W. H. Leverett, president of the National Zinc Co., was elected a director for the term ending in 1953.

Here's Another Highly Intricate ACCURATE DIE CASTING!

Motorcycle Cover and Case

THE maze of detail in this casting makes it one of the most complicated we have ever produced. Conversion to die castings on this particular job contributed to important weight reduction in the finished unit. ACCURATE DIE CASTINGS are everything the name implies.

(INQUIRIES INVITED)

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ZINC BASE
DIE CAST ALLOYS

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Certified Alloys Co.

BEDFORD, OHIO

FROM LABORATORY

(Continued from Page 43)

ing, a necessity in maintaining quality products.

The paint layout incorporates an inspection station at the exit of each booth. Each part is inspected, and hand touching-up done when necessary. After the inspection, the parts are sent through the baking oven. Baking time is 30 minutes at 325F. When the parts have cooled, they are unloaded and are ready for assembly.

The company's quality control program for finishing is backed by rigid laboratory tests and controls. The laboratory tests all paints used by the company and develops new finishing methods and techniques.

In selecting a finish for the aluminum die castings, the objective was a medium fine ripple pattern. Panels were given sample coats and tested to determine the effect of ripple pattern on sheen. The tests showed that ripples with sharp peaks gave a dead flat surface, while ripples that were rounded caused the surface to have a sheen. A soft, non-glaring surface between the two extremes was desired, and work with a paint supplier resulted in a paint which gave the desired effect.

Maintenance of the proper surface is accompanied by close inspections during the finishing operations and by laboratory testing of sample parts taken from the production line. These tests are directly related to the performance of the part in service.

The tests made on the finish and the qualities desired are:

1. Hardness test—for resistance to marring and scratching.

2. Uniformity of color and gloss — so that different parts of the machine have matching texture and color.

3. Adhesion—paint must not chip under impacts normally encountered in service.

4. Chemical resistance — of special interest is the ability of a newly-developed finish to resist stains.

OPPORTUNITIES

DIE CASTING MACHINES WANTED

Kippcaster die casting machines of all models wanted. Can use several machines in expansion program. Write Box 6151, Die Castings Magazine.

SALESMAN to sell core binding synthetic resins to foundry trade in South. Choice of territory. Commission basis. Write Box 7151, Die Castings Magazine.

5. Abrasion—to assure durability of the finish.

Tests such as the above named give a uniformity and assurance of quality not otherwise obtainable. The company has found that laboratory supervision, coupled with inspection stations on the production line, has resulted in reducing rejects for faulty finish to a very small percent.

PROMOTED BY DOW

A. W. Winston, formerly executive assistant, has been named assistant manager of the magnesium department of The Dow Chemical Company, it was announced recently by J. D. Hanawalt, manager of the magnesium department.

Mr. Winston has been associated with The Dow Chemical Company since 1920, for the past 24 years exclusively with magnesium. From 1926 to 1934, as metallurgist, experimental engineer and plant superintendent, he developed and operated processes for sand casting, die casting, extrusion, forging and rolling magnesium alloys.

Mr. Winston served as director of the magnesium laboratory staff from 1934 to 1940, in an advisory capacity for plant expansion until 1945, and has since served as executive assistant to the manager of the magnesium department.

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Aluminum alloys produced under quality controlled methods are specially designed to meet your die cast permanent mold or sand casting requirements.

For prompt dependable deliveries of quality aluminum in any quantity, write to

ALUMINUM SMELTING & REFINING CO., INC.

BEDFORD, OHIO

ALUMINUM LEAD AND ZINC

DIE CASTING BY FORT

ASSURES ACCURACY, QUALITY AND FAST DELIVERY

FORT has a complete engineering and designing department at your disposal with complete tool and die building facilities on the premises.

FORT has a large die casting department with new FORT-built die casting machines being added regularly.

FORT has designed and built a new machine for casting automobile grilles and other items of comparable size—actual die space is 40" x 60" x 36" thick.

FORT has the enlarged facilities of its Detroit plant combined with the new Marysville, Michigan plant to greatly increase the production of FORT quality die castings to meet the most exacting delivery requirements.

Certified Analysis Alloys

FORT DIE CASTING CORPORATION

MARYSVILLE, MICHIGAN

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with Quality
ALUMINUM & ZINC
Die Castings

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Trimming • Machining
Die Making • Die Casting
Plating • Assembling

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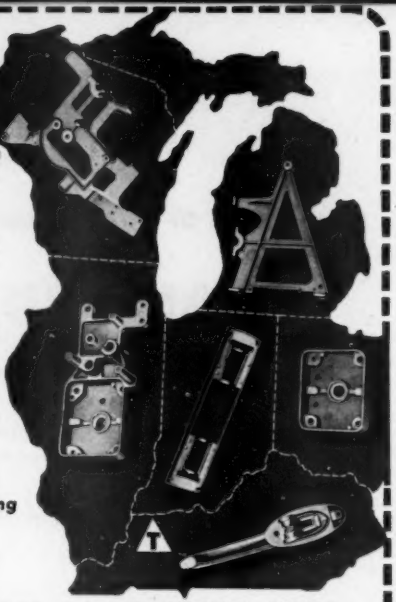

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Maximum Weight: ½ oz.
Maximum Length: 2 in.
SMALLNESS UNLIMITED

NEW PRODUCTS

(Continued from Page 48)

both operator's hands free. Adjustable spring in center column feeds tap into work. Can be used with single or multiple heads.

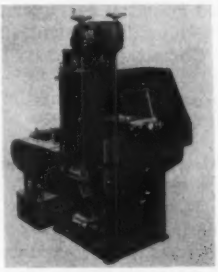
SPECIFICATIONS: Machines have varying capacities for tapping zinc and aluminum, ranging to 11/16" tap for large machine. Tap is oiled either by gravity feed from head of machine or by pump and tank system. Built-in stripper provided with single spindle set-up. Adjustable spring feeds taps, counterweights return them. No special skill is required by operator. Machine has overall height of 73", requires 22" by 28" floor space. Work table area is 16" by 10½".

For additional information circle No. 99 on the Reader Service Card.

WET ABRASIVE BELT GRINDER

Model V8-WP
Hammond Machinery Builders, Inc.
Kalamazoo, Mich.

SPECIAL FEATURES: Machine has a powered reciprocating table with tilting work holder and water-cooled platen. Designed to finish thin-walled parts without danger of heat distortion.



SPECIFICATIONS: Table travel is adjustable from 0" to 8", and the stroke speed back and forth across the abrasive belt can be varied to suit the work. Continuous film of coolant between belt and platen eliminates distortion of both work and platen. Self-contained coolant system has two tanks with a combined capacity of 35 gals. Machine can also be equipped with plain or manual reciprocating table, and for water main connection instead of self-contained pump and tanks.

For additional information circle No. 100 on the Reader Service Card.

(Continued from Page 44)

vates the zinc and also tends to improve the adhesion of the organic coatings, thus making it somewhat more resistant to salt spray tests. If a more brilliant, whiter appearance is desired then it becomes necessary to bright zinc plate before the passivating operation.

"Before we leave the subject of zinc base die castings we would like to point out that the use of our water dip coating has proved quite valuable for use on zinc and other metals. These parts are usually not finished by the subcontractor since by the time they reach the final assembly line the finish would probably be marred, scratched or abraded; and perhaps of greater importance, if the parts were not protected with Water Dip, oxidation, discoloration, finger printing and so forth would develop, and, as you know, would interfere with subsequent finishes.

"A practical and simple solution would be to apply a coat of water dip in the subcontractor's plant and the subsequent finish coats could be applied after the parts were assembled. In other instances, where the parts have to be completed by the subcontractor they could be finished by them after the initial application of the protective coating of Water Dip.

"Clear organic coatings have been tested by the Chrysler Corporation, Lincoln-Mercury and Ford, General Motors, and International Harvester Company whose laboratories in Chicago reported that some of the clear coatings stood up for the remarkable period of 800 hours in the salt spray and weatherometer tests. It was observed in these tests that after 800 hours the zinc turned gray under the finish and the finish peeled off as a sheet; however, up to the time of failure there was no sign of blistering, discoloration or any other noticeable film defect.

"The salt spray tests that were used were run at 100°F and 85% relative humidity. Prior to testing the panels were scratched through the plating in the usual cross method. One test was run on a panel coated with clear baking synthetics and another with clear air drying lacquers. Another test was run using coated panels and subjecting these panels to a heat and cold cycle test and then to salt spray exposure. For those of you who are interested in the heat and cold cycle test this was comprised of: (a) 24 hours at 175°F. (b) the panels were then allowed to cool at room temperature and then subjected to 7 hours at minus 40°F., (c) the cycle was repeated and then the panels were allowed to remain at room temperature for 48 hours, (d) the heat and cold cycle tests were repeated.

"In some cases water immersion tests were run on the panels for 48 hours at 100°F and humidity tests were also run for 48 hours at 100% relative humidity and 100°F. One

Inquiries Solicited

ZINC

DIE CASTINGS

Manufacturer in Belgium solicits inquiries for zinc alloy quality die castings.

Write to:

Leon G. Rucquoi

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The Most Complete and Modern Die-Casting Facilities in New England

Our latest type high pressure Lester Phoenix machines insure precision low-cost castings.

You can depend upon our proven know-how to design and develop your most intricate castings.

Ask to have the Mason representative call, or send us your prints. Our Engineering department will give every request, whether large or small, conscientious prompt attention.

L. E. Mason is an approved source for America's leading manufacturers.

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ALUMINUM OR ZINC ☆

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QUALITY PRODUCTS SINCE 1910

SEND BLUEPRINTS OR SAMPLES FOR QUOTATIONS

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EAST ORANGE, N. J.

OAKITE ESTABLISHES AWARD

John A. Carter, president of Oakite Products, Inc., manufacturers of industrial cleaning and related materials, has announced the establishment by the company of the David C. Ball Award for Distinguished Service, a bronze plaque to be presented annually to the member of the Oakite technical field organization who has rendered the most outstanding service to industry during the year.

The award is designed to perpetuate the memory of David Clifton Ball, founder of the company and chairman of its board of directors at the time of his death in March of this year.

"The Oakite technical service representative who wins this award," Mr. Carter stated, "will have demonstrated exceptional ability to search out and set up improved methods that will cut cleaning costs and provide superior results . . . will have consistently made certain that his customers shared his know-how in using the correct material to best advantage."

DISCRIMINATING BUYERS HAVE SELECTED

STROH SINCE 1903 FOR SERVICE

STROH SINCE 1903 FOR QUALITY

STROH SINCE 1903 FOR ECONOMY

STROH DIE MOULDED CASTING CO.
325 E. MICHIGAN ST., MILWAUKEE 2, WIS.

FEDERATED APPOINTS BUCHANAN

Federated Metals Div., American Smelting and Refining Company, has announced the appointment of A. E. Buchanan as sales representative. His territory will be under jurisdiction of Federated's Baltimore office, with A. A. Hochrein as district manager.

NEILSON CHEMICAL INCREASES CANADIAN SERVICE STAFF

The Neilson Chemical Company of Canada, manufacturers of Prep products for cleaning, rust-removing and conditioning of metal before painting, has increased the service coverage of the Montreal and Toronto areas. Mr. S. Brown, 2605 Curratteau St., Montreal, and Mr. Jack Gray, Freeman, Ontario, will represent the company.

RACINE

ZINC OR ALUMINUM die castings of highest quality produced on modern, fast equipment. Guaranteed satisfaction. Prompt service.

Inquiries Invited

Tell us your needs. Send blueprints or drawings for quotation. No obligation, of course.

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1500 16TH ST., RACINE, WIS.

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ZINC and ALUMINUM

DIE CASTINGS

• The largest and most modern equipped die casting plant in the New England States.

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President

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Are You Getting the Best Castings Made?

Central offers complete modern facilities, strategically located which assures you of getting prompt dependable service on the best castings made.

CENTRAL SERVICES PROVIDE:

- Complete engineering and design service
- Wide range of quality aluminum and zinc alloys
- Die and Tool making
- Machining and finishing facilities

Make use of our complete service and mail in your defense production requirements for prompt quotation.

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DIE CASTING and MFG. CO.
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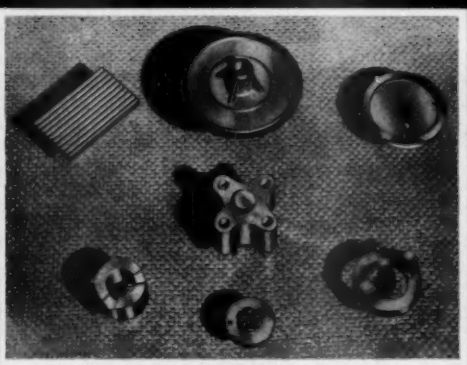
Simply Designed Parts Can Be DIE CAST In Aluminum and Magnesium At Great Savings



SIMPLE DIE CASTINGS LIKE THESE REPRESENT SAVINGS TO 50%

To die cast parts economically many believe complicated dies are required. On the contrary, comparatively simple dies for parts can be used to die cast them at lowest cost conditions. The die casting method even for these parts of simple design still greatly saves time, material and much of the labor otherwise required for machining and finishing. Using the new lightweight, yet tough, aluminum and magnesium alloys, which are still available for many uses, may solve your production-cost problem.

Illustrated above are a few die cast parts of simple design which were previously made as extrusions and sand castings. However, the extensive machining formerly required, plus their original high cost per pound of materials, made them "naturals" for die casting. In addition, die cost is low. The simple die casting, therefore, is an inexpensive starting point for those few machining operations required for finishing.

Write today for literature and design information.

Quick action on inquiries.

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A DIVISION OF HAYES INDUSTRIES

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APEX

ALUMINUM • MAGNESIUM • ZINC BASE

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Dependable high quality die cast alloy ingot—
an important factor in production for dependable die
castings—made to exacting specifications—
complete Spectrograph and Quantometer control
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DO's and DON'Ts in DESIGNING ZINC and ALUMINUM DIE CASTINGS

examples by DOLLIN

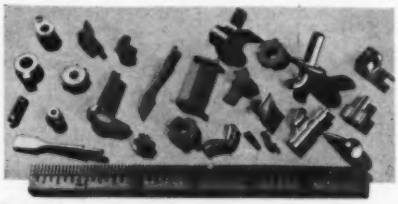
PRINCIPLE: Specifying serrated surfaces where good traction is desirable can cut costs while it improves the product.

• Zinc measuring tape housing die cast in two parts in Dollin's Small Castings Department. One screw — which engages a blind thread on the inside of the visible face—holds the halves together.

EXAMPLE: The manufacturer's original design for this measuring tape housing called for a polished surface around the entire edge a. Dollin engineers suggested incorporating the serrations (as shown) in the die castings so that (1) the polishing operation would be eliminated, (2) the housing would provide a better grip.

RESULT: Reduced costs and an improved product for the manufacturer.

SMALL ZINC
DIE CASTINGS TO 3 OZ.
Made in our special
SMALL CASTINGS DEPARTMENT

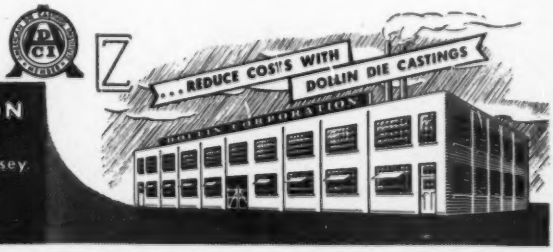


• High speed automatic casting machines with small single or double cavity dies permit widest design range, provide high production with low die and casting costs.

DOLLIN engineers will work with you on design refinements, recommending whatever changes will simplify the die casting operation, improve the soundness of the castings, or eliminate machining, finishing, or assembly operations. They have at their disposal extensive, modern facilities, and are thus free to adapt designs for lowest final cost.

Dollin can efficiently produce all commercial sizes of die castings—facilities include large plunger zinc machines, large and medium size cold chamber high pressure machines, and a separate small castings department (see left). Write for estimates and engineering advice, at no obligation.

PRIME CONTRACTORS — Check with DOLLIN for sub-contracting on defense orders



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